

THE 394 MAGNETIC ROD GROUP TYPES

Diagrams of symmetry elements and of the general position

Origin

Asymmetric unit

Symmetry operations

Generators selected

Positions

Symmetry of special projections

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Magnetic Rod Group Index

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22.8.118	$pm'cm$	28.4.143	$p4'/m'$
22.9.119	$pmcm'$	28.5.144	$p4'/m$
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28.6.145	$p_{2c}4'/m$	33.2.169	$p4_3221'$
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29.3.149	$p4_2/m'$	34.2.173	$p4mm1'$
29.4.150	$p4_2'/m'$	34.3.174	$p4m'm'$
29.5.151	$p4_2'/m$	34.4.175	$p4'mm'$
30.1.152	$p422$	34.5.176	$p_{2c}4m'm'$
30.2.153	$p4221'$	34.6.177	$p_{2c}4'm'm$
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30.4.155	$p4'22'$	35.1.179	$p4_2cm$
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30.6.157	$p_{2c}422$	35.3.181	$p4_2c'm'$
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39.3.202	$\rho 4/m'm'm'$	42.1.226	$\rho 3$
39.4.203	$\rho 4/mm'm'$	42.2.227	$\rho 31'$
39.5.204	$\rho 4/m'mm$	42.3.228	$\rho_{2c}3$
39.6.205	$\rho 4'/m'm'm$	43.1.229	$\rho 3_1$
39.7.206	$\rho 4'/mmm'$	43.2.230	$\rho 3_11'$
39.8.207	$\rho_{2c}4/mm'm'$	43.3.231	$\rho_{2c}3_2$
39.9.208	$\rho_{2c}4'/mmm'$	44.1.232	$\rho 3_2$
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40.1.210	$\rho 4/mcc$	44.3.234	$\rho_{2c}3_1$
40.2.211	$\rho 4/mcc1'$	45.1.235	$\rho\bar{3}$
40.3.212	$\rho 4/m'c'c'$	45.2.236	$\rho\bar{3}1'$
40.4.213	$\rho 4/mc'c'$	45.3.237	$\rho\bar{3}'$
40.5.214	$\rho 4/m'cc$	45.4.238	$\rho_{2c}\bar{3}$
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48.4.250	$p_{2c}3_112$	53.4.274	$p_{2c}6'$
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49.5.255	$p_{2c}3m1$	55.1.279	$p6_2$
50.1.256	$p3c1$	55.2.280	$p6_21'$
50.2.257	$p3c11'$	55.3.281	$p6_2'$
50.3.258	$p3c'1$	55.4.282	$p_{2c}6_2$
		55.5.283	$p_{2c}6_2'$
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51.2.260	$p\bar{3}1m1'$	56.2.285	$p6_31'$
51.3.261	$p\bar{3}'1m'$	56.3.286	$p6_3'$
51.4.262	$p\bar{3}1m'$		
51.5.263	$p\bar{3}'1m$	57.1.287	$p6_4$
51.6.264	$p_{2c}\bar{3}1m'$	57.2.288	$p6_41'$

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58.1.292	$p6_5$	62.6.316	$p_{2c}622$
58.2.293	$p6_51'$	63.1.317	$p6_122$
58.3.294	$p6_5'$	63.2.318	$p6_1221'$
59.1.295	$p\bar{6}$	63.3.319	$p6_12'2'$
59.2.296	$p\bar{6}1'$	63.4.320	$p6_1'2'2$
59.3.297	$p\bar{6}'$	64.1.321	$p6_222$
59.4.298	$p_{2c}\bar{6}$	64.2.322	$p6_2221'$
60.1.299	$p6/m$	64.3.323	$p6_22'2'$
60.2.300	$p6/m1'$	64.4.324	$p6_2'2'2$
60.3.301	$p6/m'$	64.5.325	$p_{2c}6_222$
60.4.302	$p6'/m'$	64.6.326	$p_{2c}6_2'22'$
60.5.303	$p6'/m$	65.1.327	$p6_322$
60.6.304	$p_{2c}6'/m'$	65.2.328	$p6_3221'$
60.7.305	$p_{2c}6/m$	65.3.329	$p6_32'2'$
61.1.306	$p6_3/m$	65.4.330	$p6_3'2'2$
61.2.307	$p6_3/m1'$	66.1.331	$p6_422$
61.3.308	$p6_3/m'$	66.2.332	$p6_4221'$
61.4.309	$p6_3'/m'$	66.3.333	$p6_42'2'$
61.5.310	$p6_3'/m$	66.4.334	$p6_4'2'2$
62.1.311	$p622$	66.5.335	$p_{2c}6_4'22'$
62.2.312	$p6221'$	66.6.336	$p_{2c}6_422$

67.1.337	$p6_522$	71.6.362	$p_{2c}\bar{6}m'2'$
67.2.338	$p6_5221'$	71.7.363	$p_{2c}\bar{6}m2$
67.3.339	$p6_52'2'$	72.1.364	$p\bar{6}c2$
67.4.340	$p6_5'2'2$	72.2.365	$p\bar{6}c21'$
68.1.341	$p6mm$	72.3.366	$p\bar{6}c'2'$
68.2.342	$p6mm1'$	72.4.367	$p\bar{6}'c2'$
68.3.343	$p6m'm'$	72.5.368	$p\bar{6}'c'2$
68.4.344	$p6'mm'$	73.1.369	$p6/mmm$
68.5.345	$p_{2c}6m'm'$	73.2.370	$p6/mmm1'$
68.6.346	$p_{2c}6'mm'$	73.3.371	$p6/m'm'm'$
68.7.347	$p_{2c}6mm$	73.4.372	$p6/mm'm'$
69.1.348	$p6cc$	73.5.373	$p6/m'mm$
69.2.349	$p6cc1'$	73.6.374	$p6'/m'm'm$
69.3.350	$p6c'c'$	73.7.375	$p6'/mmm'$
69.4.351	$p6'cc'$	73.8.376	$p_{2c}6/mm'm'$
70.1.352	$p6_3mc$	73.9.377	$p_{2c}6'/m'mm'$
70.2.353	$p6_3mc1'$	73.10.378	$p_{2c}6/mmm$
70.3.354	$p6_3m'c'$	74.1.379	$p6/mcc$
70.4.355	$p6_3'mc'$	74.2.380	$p6/mcc1'$
70.5.356	$p6_3'm'c$	74.3.381	$p6/m'c'c'$
71.1.357	$p\bar{6}m2$	74.4.382	$p6/mc'c'$
71.2.358	$p\bar{6}m21'$	74.5.383	$p6/m'cc$
71.3.359	$p\bar{6}m'2'$	74.6.384	$p6'/m'c'c$
71.4.360	$p\bar{6}'m2'$	74.7.385	$p6'/mcc'$
71.5.361	$p\bar{6}'m'2$	75.1.386	$p6_3/mmc$

75.2.387	$\rho 6_3/mmc1'$
75.3.388	$\rho 6_3/m'm'c'$
75.4.389	$\rho 6_3/mm'c'$
75.5.390	$\rho 6_3/m'mc$
75.6.391	$\rho 6_3'/m'mc'$
75.7.392	$\rho 6_3'/m'm'c$
75.8.393	$\rho 6_3'/mmc'$
75.9.394	$\rho 6_3'/mm'c$

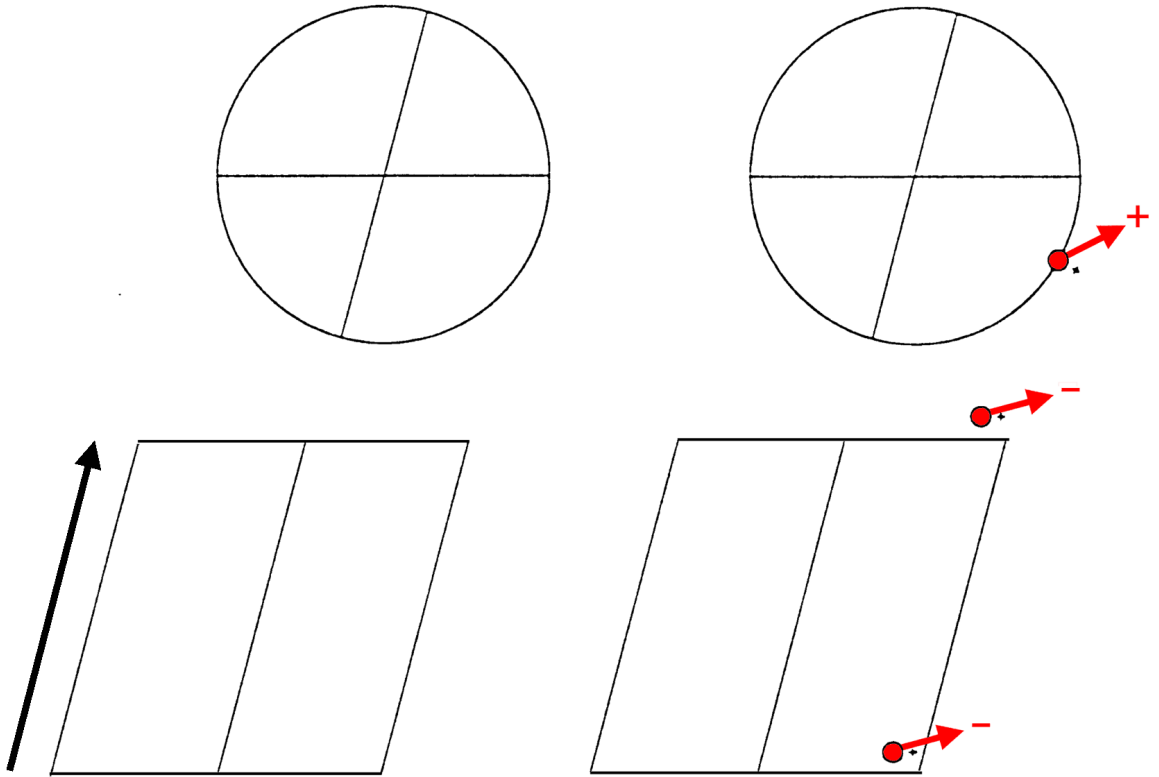
$p1$

1

Triclinic

No. 1.1.1

$p1$



Origin arbitrary

Asymmetric unit $0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

Continued

No. 1.1.1

*p*1

Generators selected (1); $t(0,0,1)$

Positions

	Coordinates
Multiplicity, Wyckoff letter, Site symmetry	

1 a 1	(1) x,y,z [u,v,w]
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Symmetry of special projections

Along [001] 1	Along [100] <i>p</i> 1	Along [010] <i>p</i> 1
Origin at 0,0,z	$a^* = c_p$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

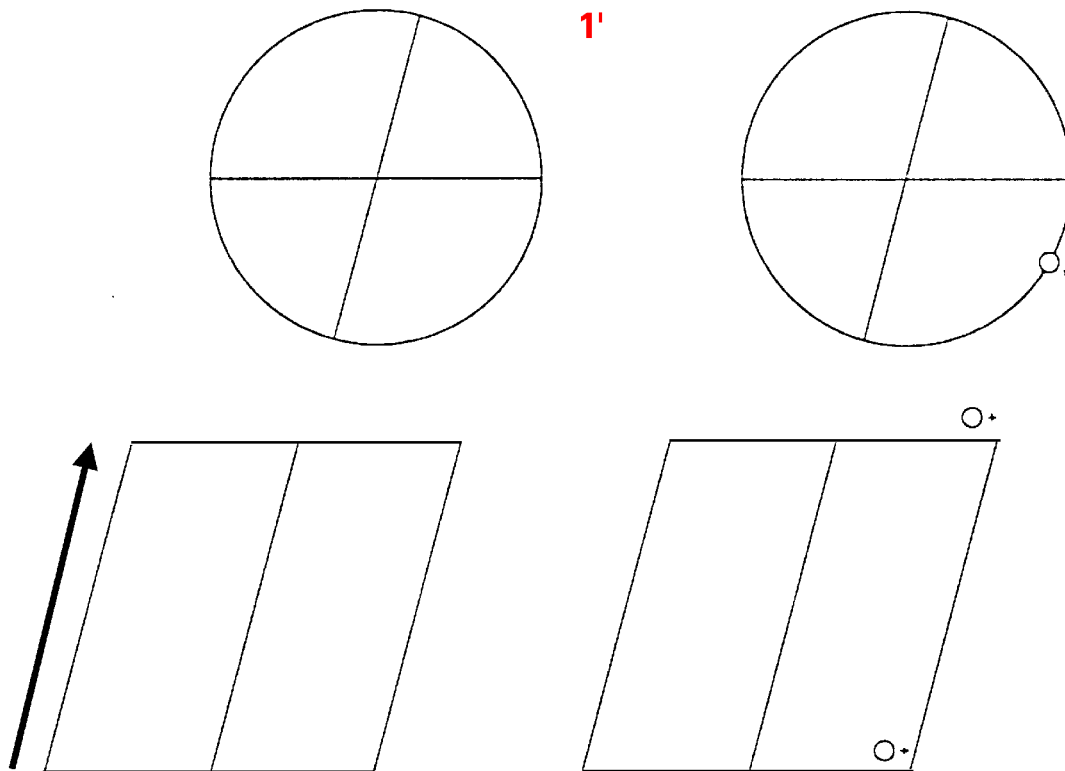
$p11'$

No. 1.2.2

$1'$

$p11'$

Triclinic



Origin arbitrary

Asymmetric unit $0 \leq z \leq 1$

Symmetry operations

For 1 + set
(1) 1
(1|0,0,0)

For $1'$ + set
(1) $1'$
(1|0,0,0)'

Continued

No. 1.2.2

$p11'$

Generators selected (1); $t(0,0,1)$; $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1'+$
1 a $11'$	(1) x,y,z	[0,0,0]

Symmetry of special projections

Along [001] $11'$	Along [100] $p11'$	Along [010] $p11'$
Origin at 0,0,z	$a^* = c_p$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

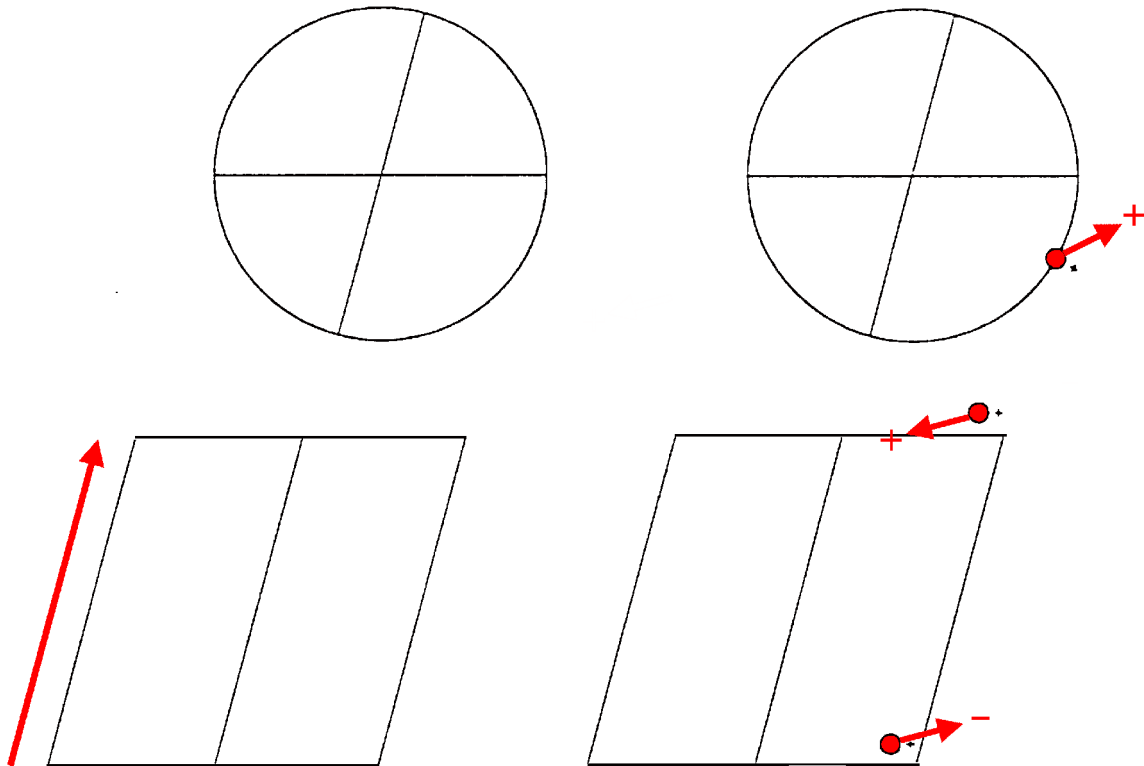
$\rho_{2c}1$

$1'$

Triclinic

No. 1.3.3

$\rho_{2c}1$



Origin arbitrary

Asymmetric unit $0 \leq z \leq 1$

Symmetry operations

For $(0,0,0) +$ set
(1) 1
(1| $0,0,0$)

For $(0,0,1)'$ + set
(1) $t'(0,0,1)$
(1| $0,0,1$)'

Continued

No. 1.3.3

$p_{2c}1$

Generators selected (1); $t(0,0,1)'$

Positions

Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

$(0,0,0)+$ $(0,0,1)'+$

1 a 1 (1) x,y,z [u,v,w]

Symmetry of special projections

Along [001] $11'$

Along [100] $p_{2a^*}1$

Along [010] $p_{2a^*}1$

Origin at 0,0,z

$a^* = c_p$
Origin at x,0,0

$a^* = c_p$
Origin at 0,y,0

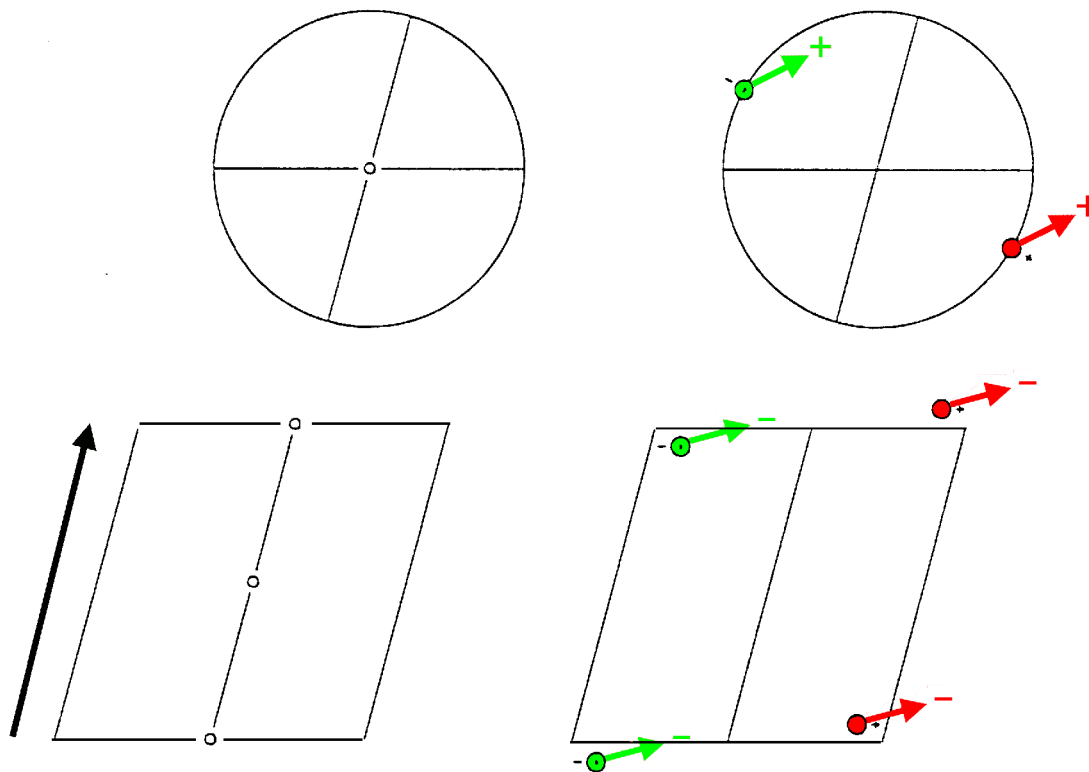
$p\bar{1}$

$\bar{1}$

Triclinic

No. 2.1.4

$p\bar{1}$



Origin at $\bar{1}$

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

- (1) 1
- (2) $\bar{1}$ $0,0,0$
- (1|0,0,0) ($\bar{1}$ |0,0,0)

Generators selected (1); $t(0,0,1)$; (2)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},\bar{z} [u,v,w]
2 c $\bar{1}$	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},\bar{z} [u,v,w]
1 b $\bar{1}$	0,0,1/2 [u,v,w]	
1 a $\bar{1}$	0,0,0 [u,v,w]	

Symmetry of special projections

Along [001] $2'11$	Along [100] $p2'11$	Along [010] $p2'11$
Origin at 0,0,z	$a^* = c_p$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

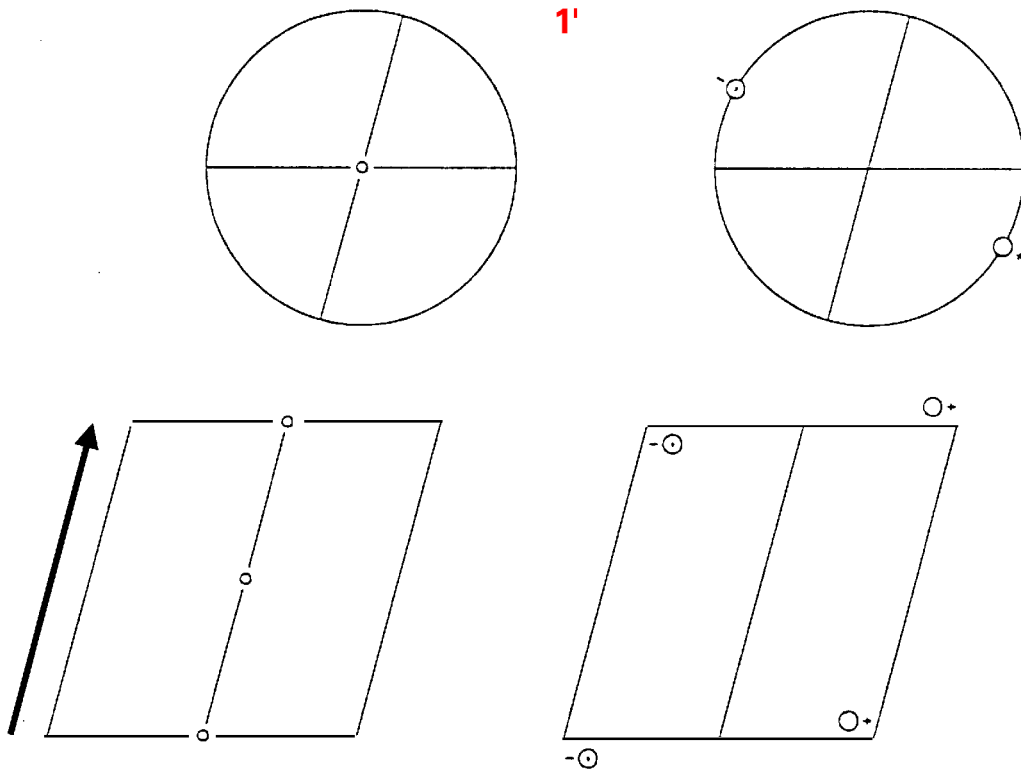
$p\bar{1}1'$

$\bar{1}1'$

Triclinic

No. 2.2.5

$p\bar{1}1'$



Origin at $\bar{1}1'$

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

For 1 + set

(1) 1	(2) $\bar{1}$ 0,0,0
(1 0,0,0)	($\bar{1}$ 0,0,0)

For 1' + set

(1) 1'	(2) $\bar{1}'$ 0,0,0
(1 0,0,0)'	($\bar{1}'$ 0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1'+$
2 c $11'$	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},\bar{z} [0,0,0]
1 b $\bar{1}1'$	0,0,1/2 [0,0,0]	
1 a $\bar{1}1'$	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] $2111'$	Along [100] $p2111'$	Along [010] $p2111'$
Origin at 0,0,z	$a^* = c_p$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

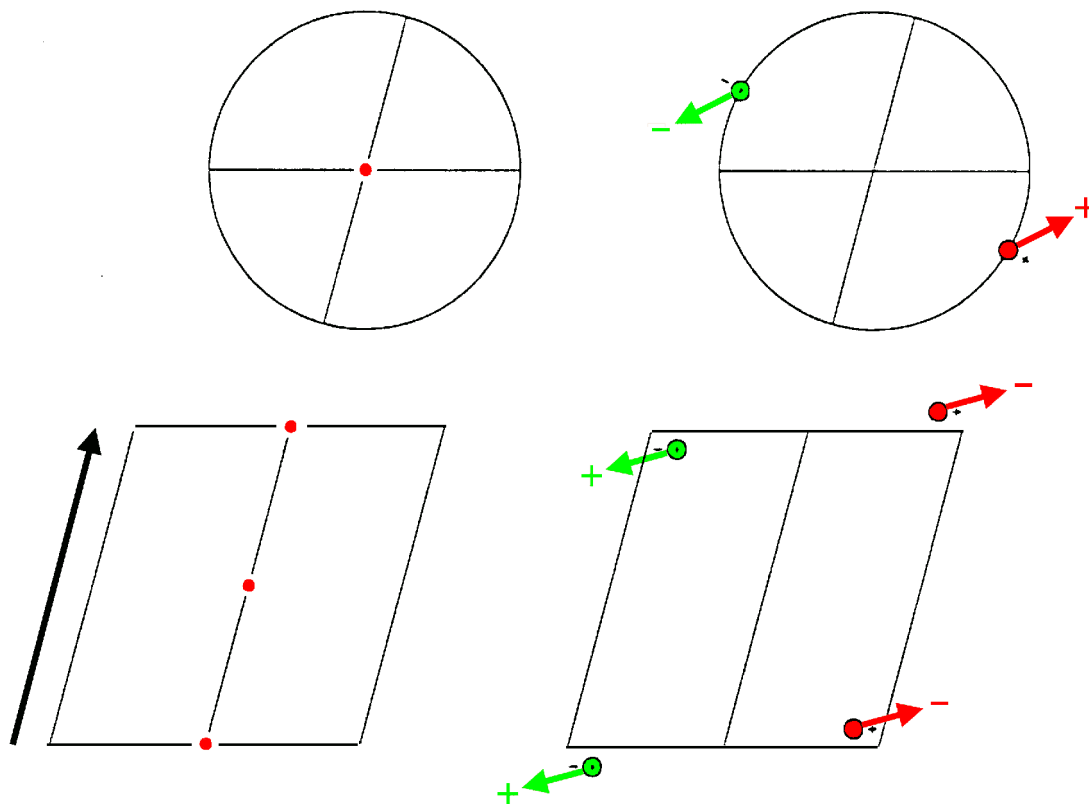
$p\bar{1}$

No. 2.3.6

$\bar{1}$

$p\bar{1}$

Triclinic



Origin at $\bar{1}$

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]
2 c 1			
1 b $\bar{1}$	0,0,1/2 [0,0,0]		
1 a $\bar{1}$	0,0,0 [0,0,0]		

Symmetry of special projections

Along [001] 211	Along [100] $\rho 211$	Along [010] $\rho 211$
Origin at 0,0,z	$a' = c_p$ Origin at x,0,0	$a' = c_p$ Origin at 0,y,0

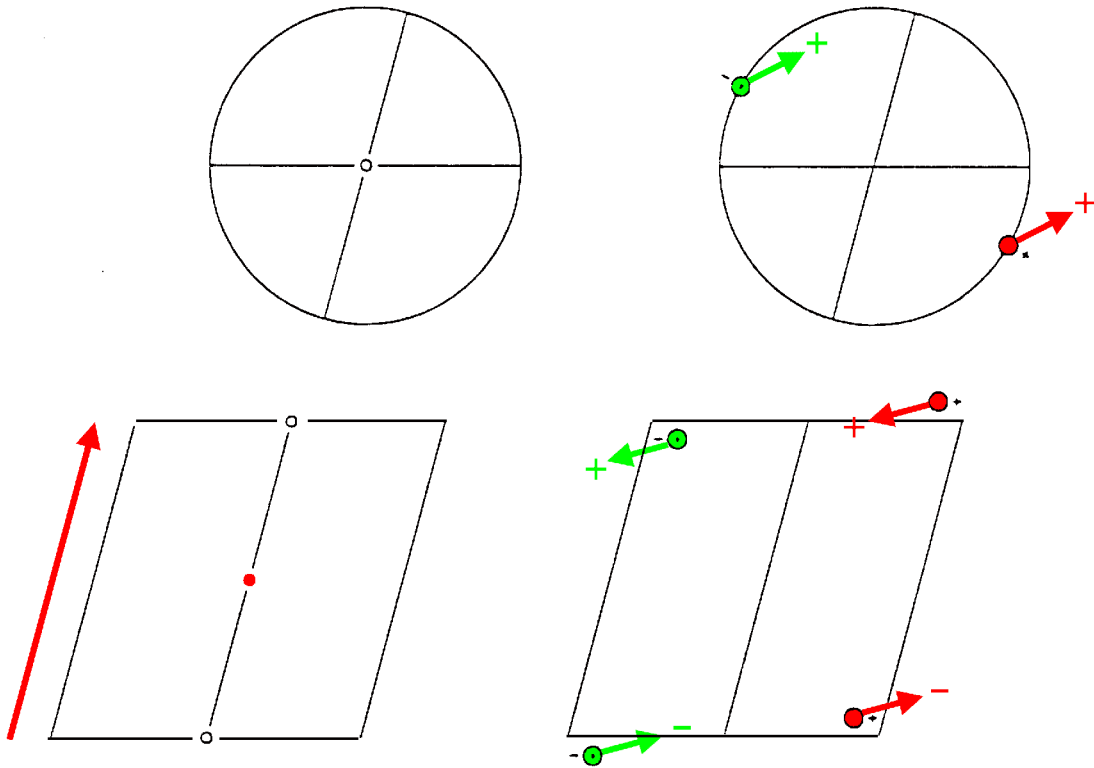
$\rho_{2c}\bar{1}$

No. 2.4.7

$\bar{1}1'$

$\rho_{2c}\bar{1}$

Triclinic



Origin at $\bar{1}$

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 (2) $\bar{1}$ 0,0,0
 (1|0,0,0) ($\bar{1}$ |0,0,0)

For $(0,0,1)'$ + set
 (1) t' (0,0,1) (2) $\bar{1}'$ 0,0,1/2
 (1|0,0,1)' ($\bar{1}$ |0,0,1)'

Generators selected (1); $t(0,0,1)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)' +
2 c 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},\bar{z} [u,v,w]	
1 b $\bar{1}$ '	0,0,1/2 [0,0,0]		
1 a $\bar{1}$	0,0,0 [u,v,w]		

Symmetry of special projections

Along [001] 2111'	Along [100] $P_{2a^*}2'11$	Along [010] $P_{2a^*}2'11$
Origin at 0,0,z	$a^* = c_p$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

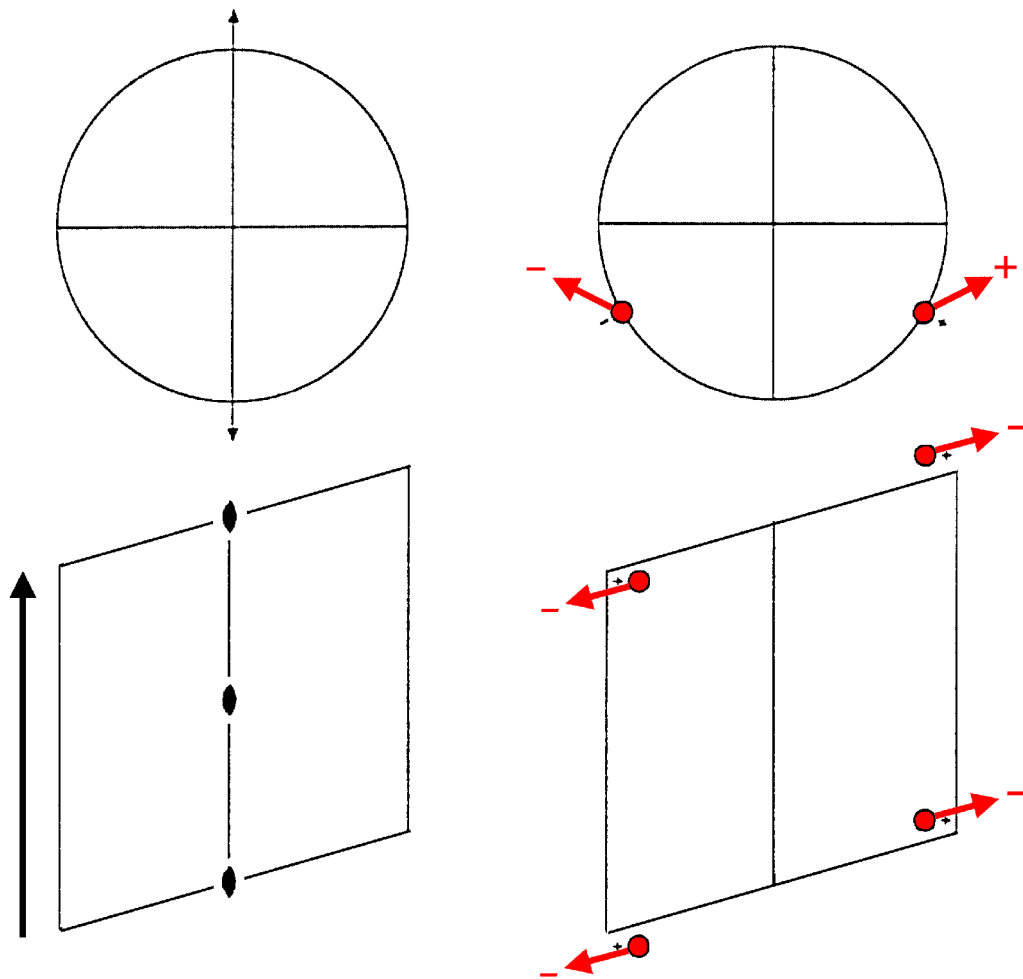
$p211$

2

Monoclinic/Oblique

No. 3.1.8

$p211$



Origin on 2

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $x,0,0$
(2_x|0,0,0)

Generators selected (1); $t(0,0,1)$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
2 c 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]	
1 b 2	$x,0,1/2$ [u,0,0]		
1 a 2	$x,0,0$ [u,0,0]		

Symmetry of special projections

Along [001] $11m'$ Origin at 0,0,z	Along [100] $p211$ $a^* = c$ Origin at x,0,0	Along [010] $p1m'1$ $a^* = c_p$ Origin at 0,y,0
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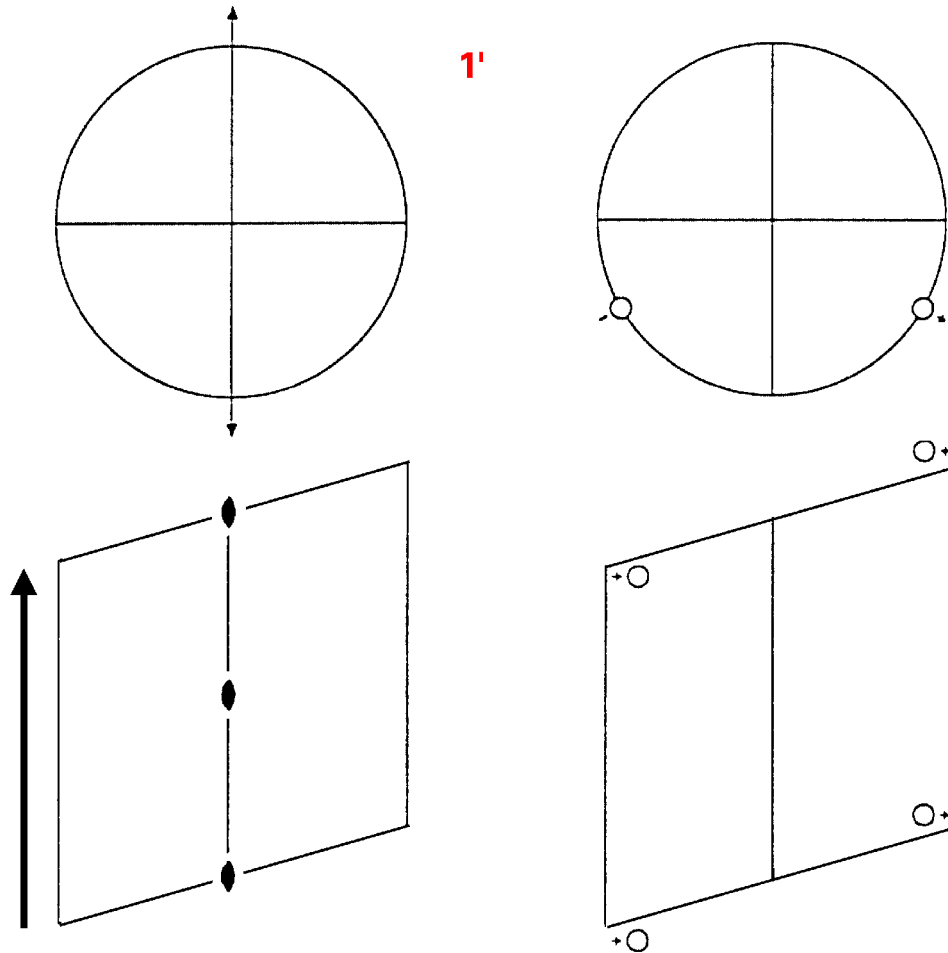
$p2111'$

$21'$

Monoclinic/Oblique

No. 3.2.9

$p2111'$



Origin on $21'$

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set
 (1) 1 (2) $2 \ x,0,0$
 (1) $|0,0,0$ (2) $|0,0,0$

For $1' +$ set
 (1) $1'$ (2) $2' \ x,0,0$
 (1) $|0,0,0'$ (2) $|0,0,0'$

Generators selected (1); $t(0,0,1)$; (2); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		1+ 1' +
2 c 11'	(1) x,y,z [0,0,0]	(2) x,\bar{y},\bar{z} [0,0,0]
1 b 21'	$x,0,1/2$ [0,0,0]	
1 a 21'	$x,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] $11m1'$	Along [100] $p2111'$	Along [010] $p1m11'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c_p$ Origin at 0,y,0

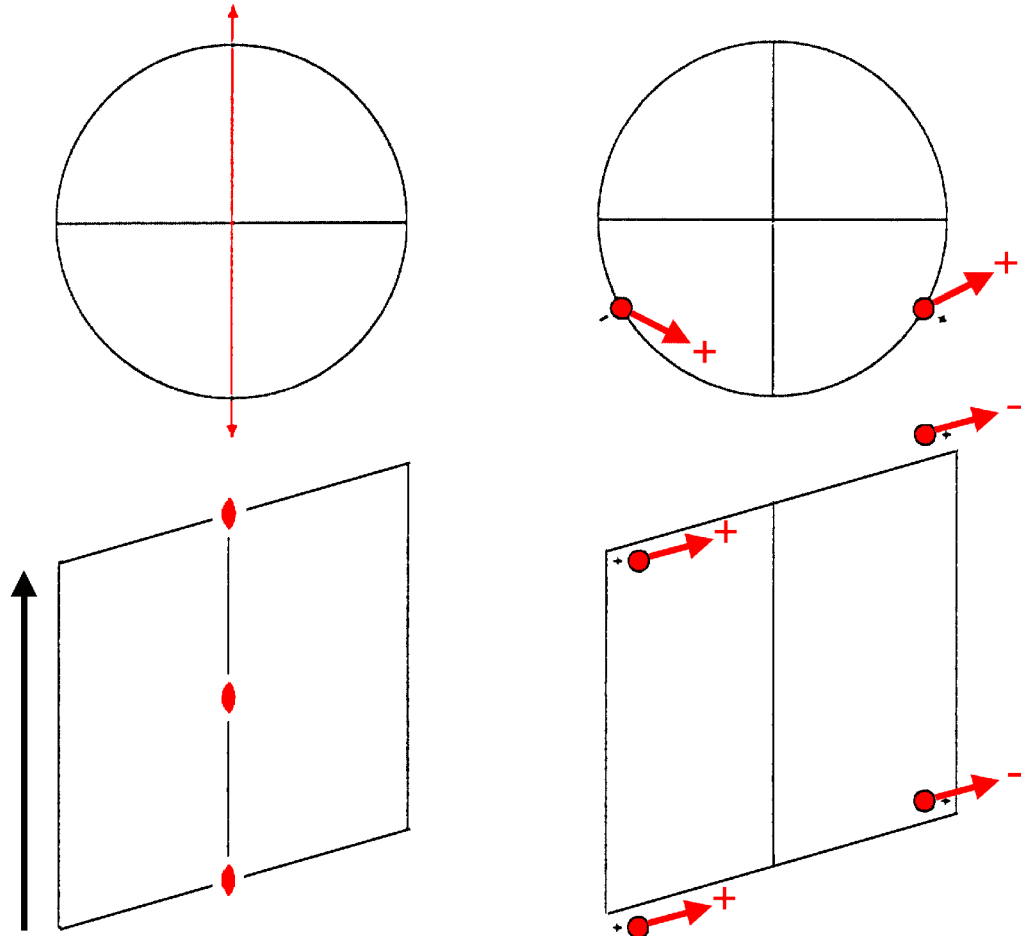
$p2'11$

No. 3.3.10

$2'$

$p2'11$

Monoclinic/Oblique



Origin on $2'$

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

- | | |
|--------------|--------------------|
| (1) 1 | (2) $2'_x$ $x,0,0$ |
| (1) $ 0,0,0$ | (2) $ 0,0,0$ |

Generators selected (1); $t(0,0,1)$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
2 c 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u} ,v,w]	
1 b 2'	$x,0,1/2$ [0,v,w]		
1 a 2'	$x,0,0$ [0,v,w]		

Symmetry of special projections

Along [001] $11m$	Along [100] $p2'11$	Along [010] $p1m1$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

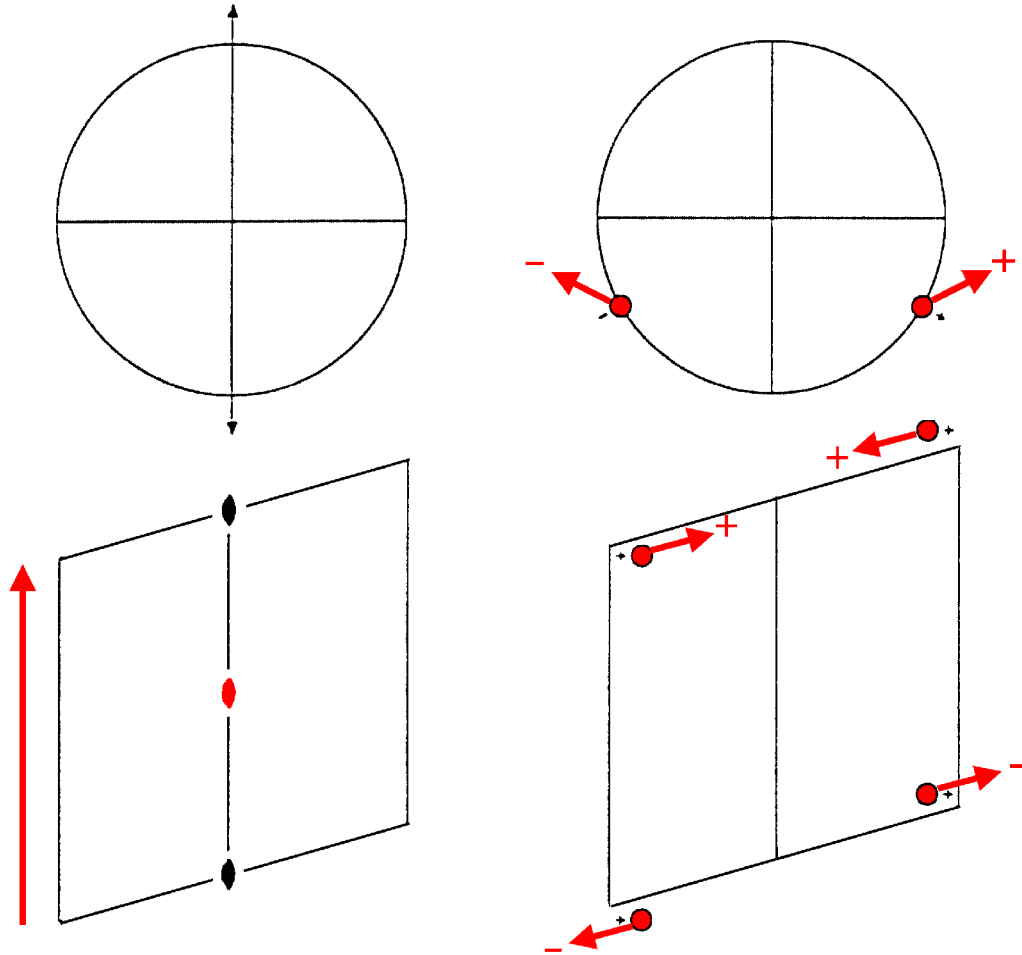
$p_{2c}211$

$21'$

Monoclinic/Oblique

No. 3.4.11

$p_{2c}211$



Origin on 2

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 (2) $2 \ x,0,0$
 (1| $0,0,0$) (2_x| $0,0,0$)

For $(0,0,1)'$ + set
 (1) $t' \ (0,0,1)$ (2) $2' \ x,0,0; \ 0,0,1/2$
 (1| $0,0,1$)' (2_x| $0,0,1$)'

Generators selected (1); $t(0,0,1)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)' +
2 c 1	(1) x,y,z [u,v,w]	(2) x, \bar{y} , \bar{z} [u, \bar{v} , \bar{w}]	
1 b 2'	x,0,1/2 [0,v,w]		
1 a 2	x,0,0 [u,0,0]		

Symmetry of special projections

Along [001] $11m'$	Along [100] $p_{2a^*}211$	Along [010] $p_{2a^*}1m'1$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

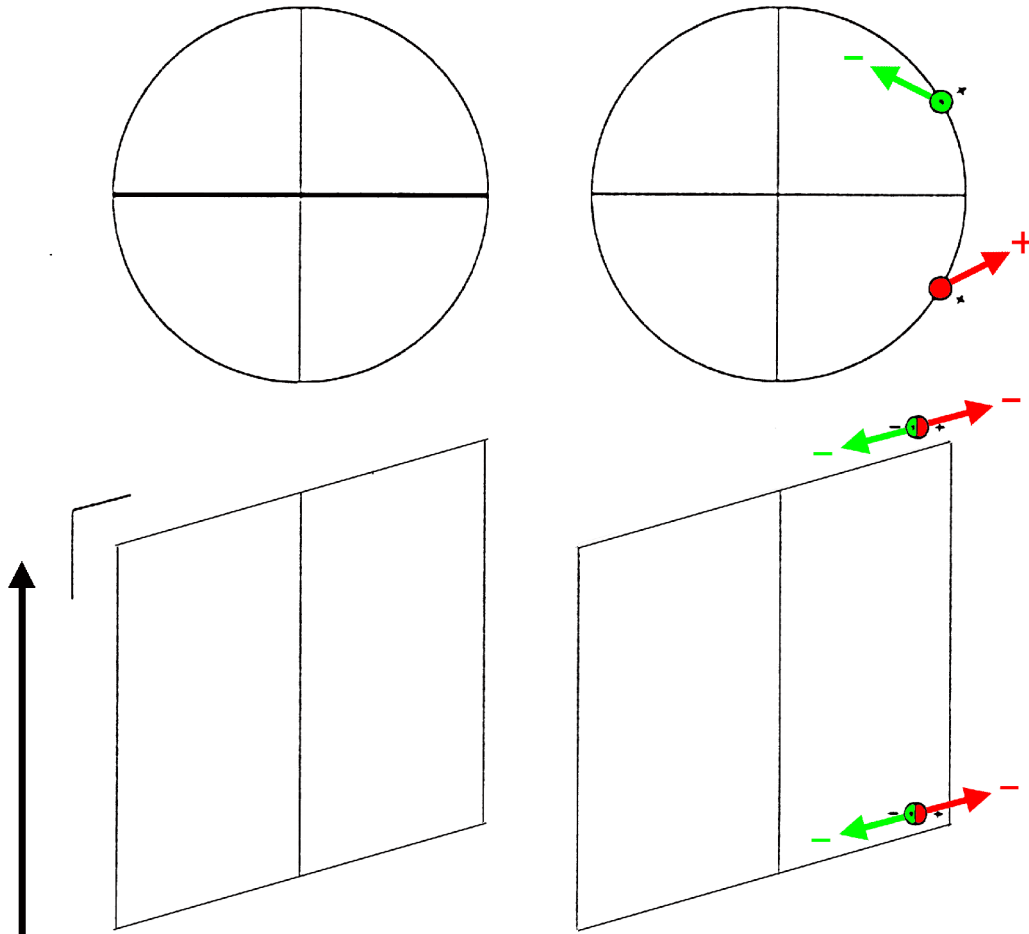
$pm11$

m

Monoclinic/Oblique

No. 4.1.12

$pm11$



Origin on mirror plane m

Asymmetric unit $0 \leq x$; $0 \leq z \leq 1$

Symmetry operations

(1) 1 (1|0,0,0) (2) m $0,y,z$ (m_x |0,0,0)

Generators selected (1); $t(0,0,1)$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
2 b 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,z [u, \bar{v} , \bar{w}]	
1 a m	$0,y,z$ [u,0,0]		

Symmetry of special projections

Along [001] 1m1	Along [100] $p1111'$ $\mathbf{a}^* = \mathbf{c}$	Along [010] $p11m$ $\mathbf{a}^* = \mathbf{c}_p$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

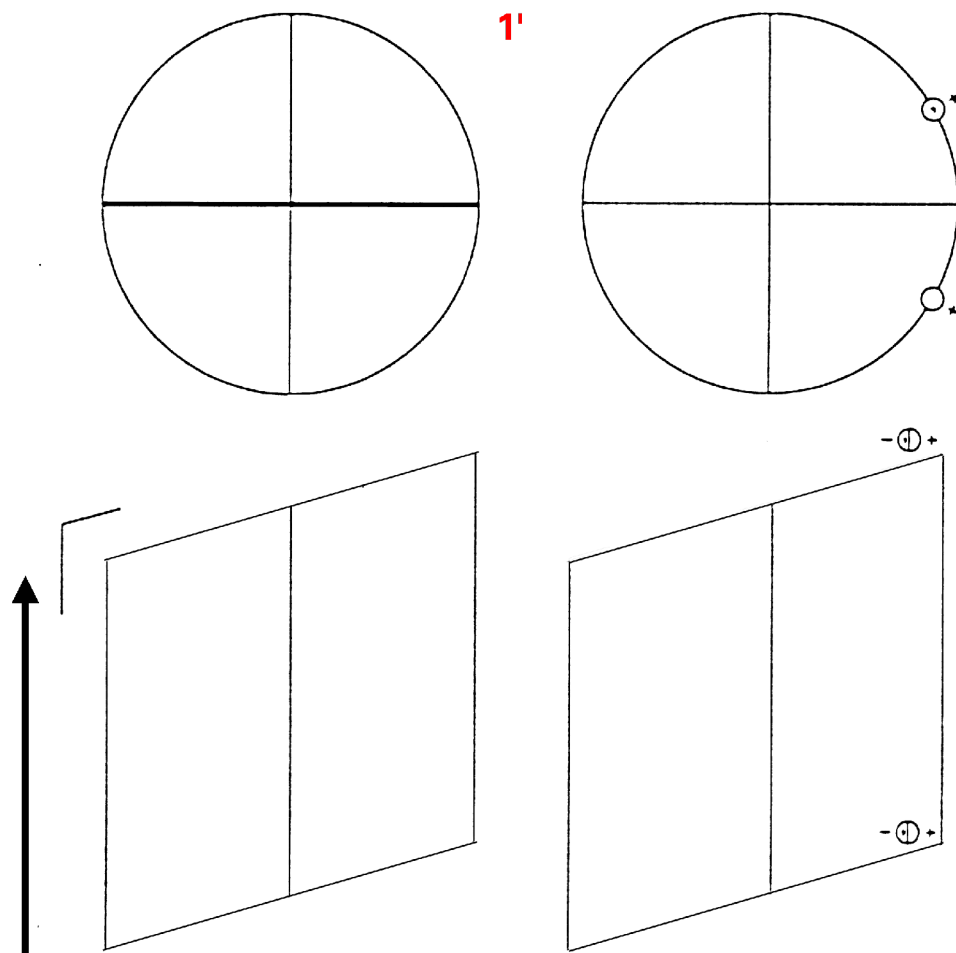
$pm111'$

$m1'$

Monoclinic/Oblique

No. 4.2.13

$pm111'$



Origin on mirror plane $m1'$

Asymmetric unit $0 \leq x ; 0 \leq z \leq 1$

Symmetry operations

For 1 + set

(1) 1	(2) m	0,y,z
(1 0,0,0)	(m _x 0,0,0)	

For 1' + set

(1) 1'	(2) m'	0,y,z
(1 0,0,0)'	(m _x 0,0,0)'	

Continued

No. 4.2.13

$pm111'$

Generators selected (1); $t(0,0,1)$; (2); $1'$

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		$1+$	$1'+$
2	$b\ 11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},y,z [0,0,0]$
1	$a\ m1'$	$0,y,z [0,0,0]$	

Symmetry of special projections

Along $[001]$ $1m11'$	Along $[100]$ $p1111'$	Along $[010]$ $p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c_p$ Origin at $0,y,0$

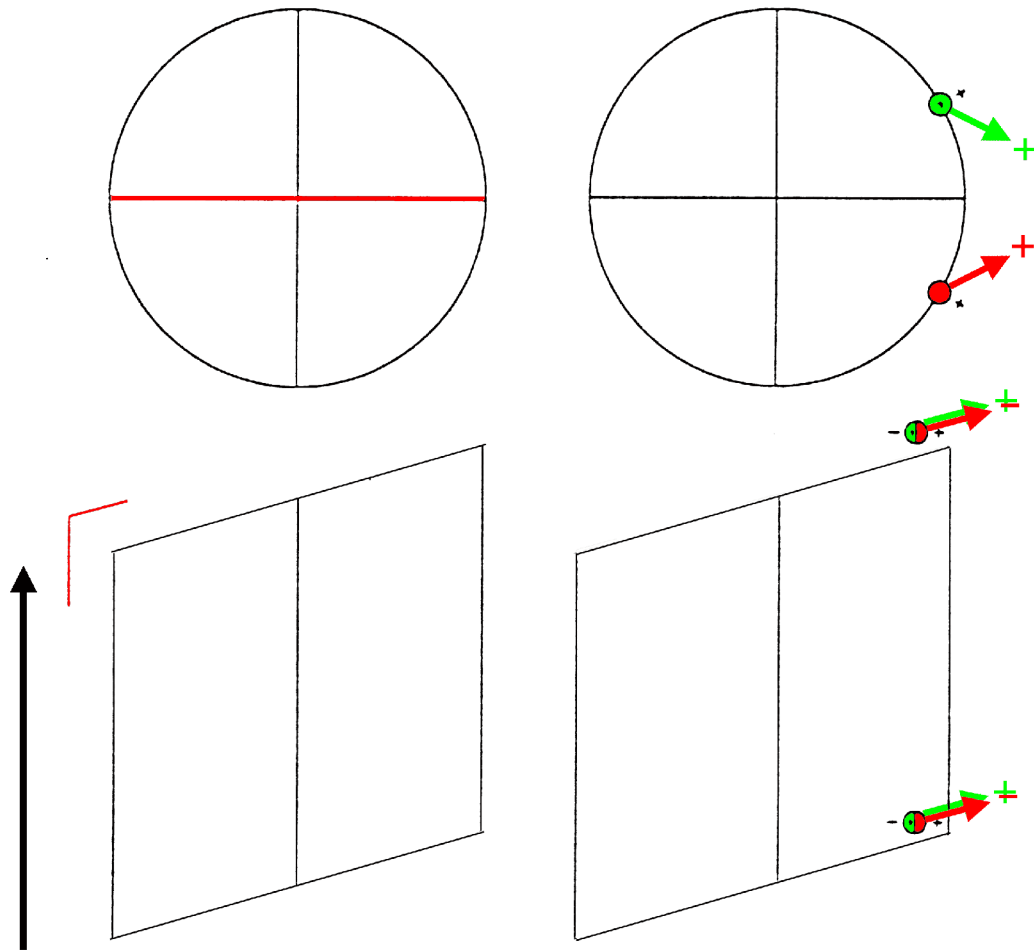
$pm'11$

m'

Monoclinic/Oblique

No. 4.3.14

$pm'11$



Origin on mirror plane m'

Asymmetric unit $0 \leq x$; $0 \leq z \leq 1$

Symmetry operations

- (1) 1 (2) m' $0,y,z$
 $(1|0,0,0)$ $(m_x|0,0,0)'$

Generators selected (1); $t(0,0,1)$; (2)

Positions

		Coordinates	
		Multiplicity, Wyckoff letter, Site symmetry	
2	b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,z [\bar{u},v,w]$
1	a m'	$0,y,z [0,v,w]$	

Symmetry of special projections

Along [001] $1m'$	Along [100] $\rho 111$	Along [010] $\rho 11m'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c_p$ Origin at $0,y,0$

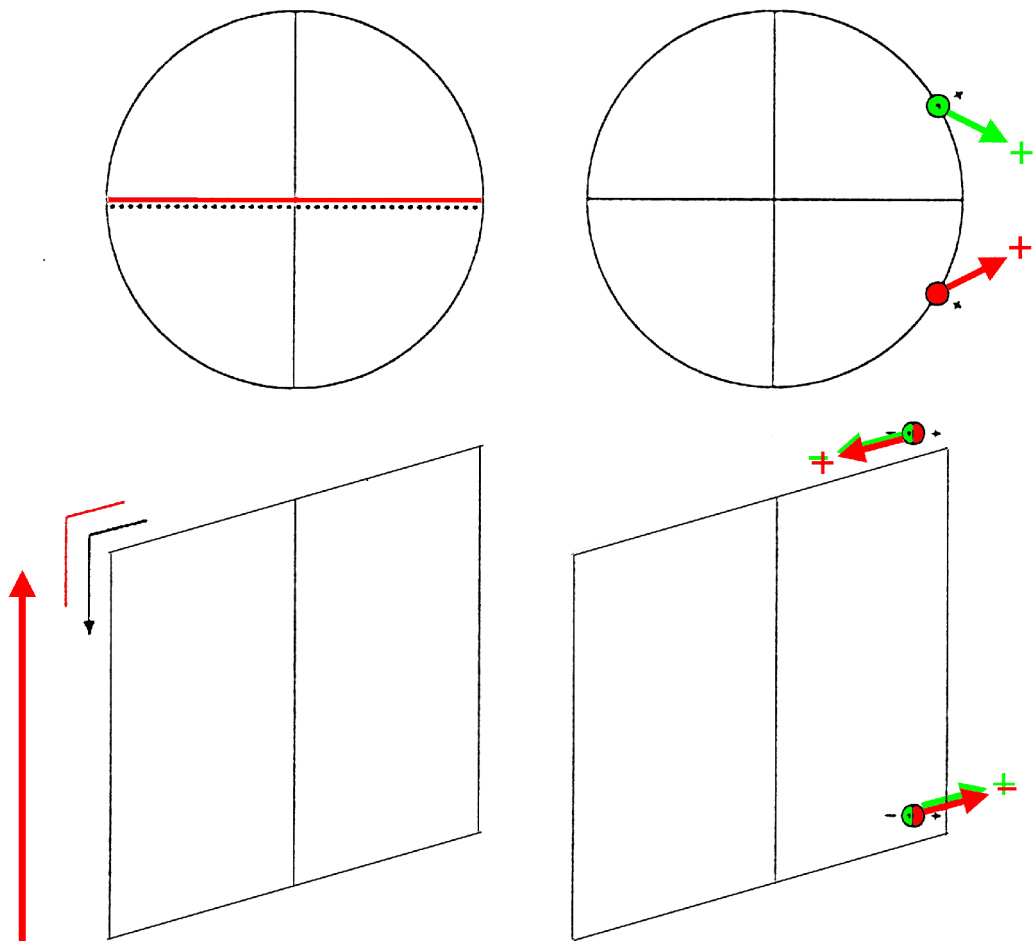
$\rho_{2c}.m'11$

$m1'$

Monoclinic/Oblique

No. 4.4.15

$\rho_{2c}.m'11$



Origin on mirror plane m'

Asymmetric unit $0 \leq x ; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0) +$ set
 (1) 1 (2) $m' 0,y,z$
 (1|0,0,0) ($m_x|0,0,0$)'

For $(0,0,1)'$ + set
 (1) $t' (0,0,1)$ (2) $c (0,0,1) 0,y,z$
 (1|0,0,1)' ($m_x|0,0,1$)'

Generators selected (1); $t(0,0,1)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)' +
2	b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,z [\bar{u},v,w]$
1	a m'	$0,y,z [0,v,w]$	

Symmetry of special projections

Along [001] $1m11'$	Along [100] $\rho_{2a^*}111$	Along [010] $\rho_{2a^*}11m'$
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}_p$ Origin at 0,y,0

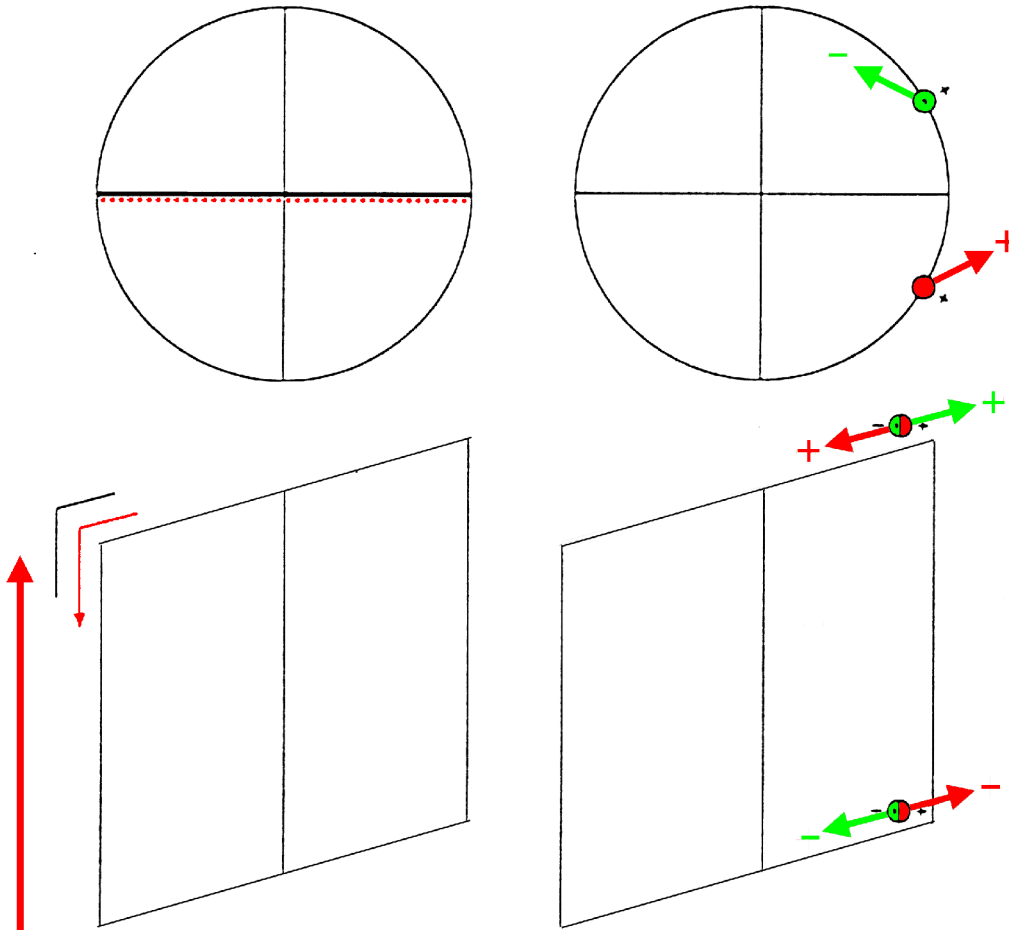
$\rho_{2c}m11$

$m1'$

Monoclinic/Oblique

No. 4.5.16

$\rho_{2c}m11$



Origin on mirror plane m

Asymmetric unit $0 \leq x$; $0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 (2) $m \ 0,y,z$
 (1| $0,0,0$) ($m_x|0,0,0$)

For $(0,0,1)'$ + set
 (1) $t' \ (0,0,1)$ (2) $c' \ (0,0,1) \ 0,y,z$
 (1| $0,0,1$)' ($m_x|0,0,1$)'

Generators selected (1); $t(0,0,1)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)' +
2	b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,z [u,\bar{v},\bar{w}]$
1	a m	$0,y,z [u,0,0]$	

Symmetry of special projections

Along [001] $1m11'$	Along [100] $p1111'$	Along [010] $p_{2a^*}11m$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

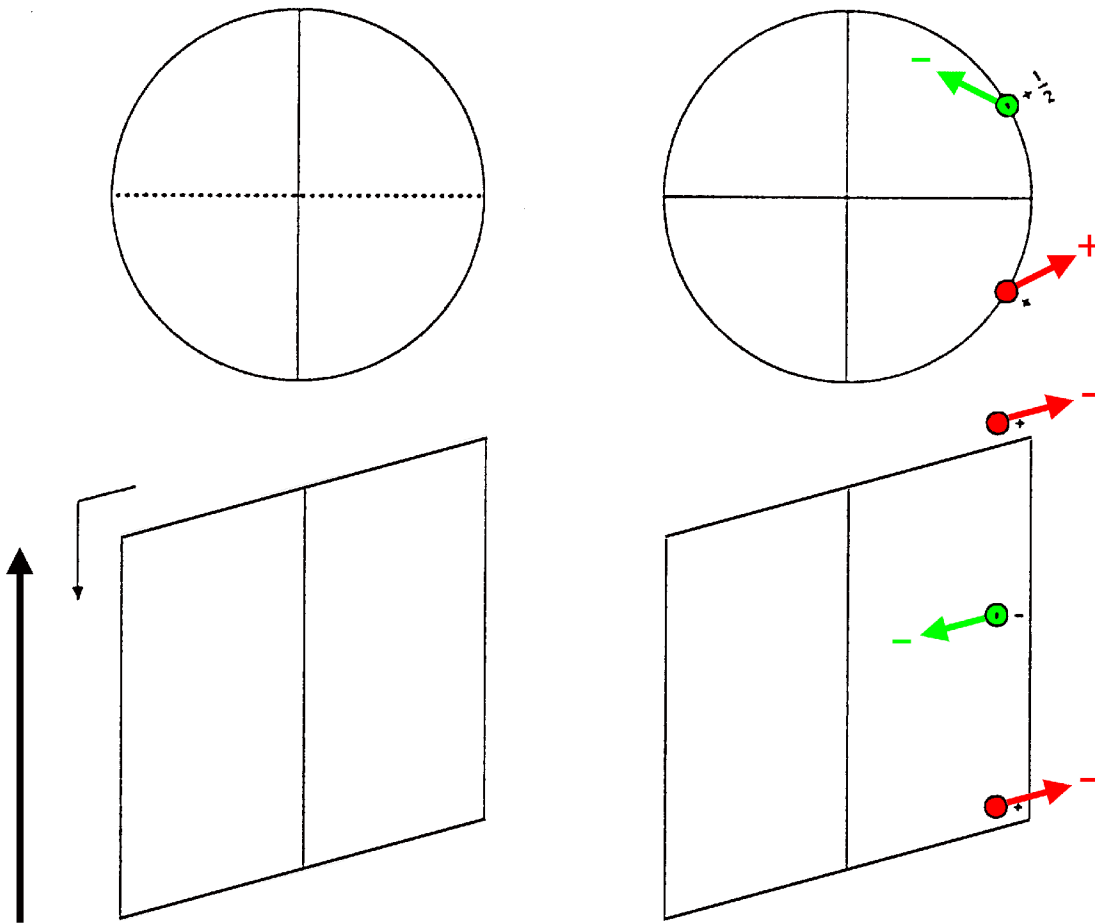
pc11

No. 5.1.17

m

pc11

Monoclinic/Oblique



Origin on glide plane c

Asymmetric unit $0 \leq x$; $0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) c (0,0,1/2) 0,y,z
(m_x|0,0,1/2)

Generators selected (1); $t(0,0,1)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 a 1	(1) x,y,z $[u,v,w]$	(2) $\bar{x},y,z+1/2$ $[u,\bar{v},\bar{w}]$

Symmetry of special projections

Along [001] $1m1$	Along [100] $p_{2a^*}1$	Along [010] $p11g$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c_p$ Origin at $0,y,0$

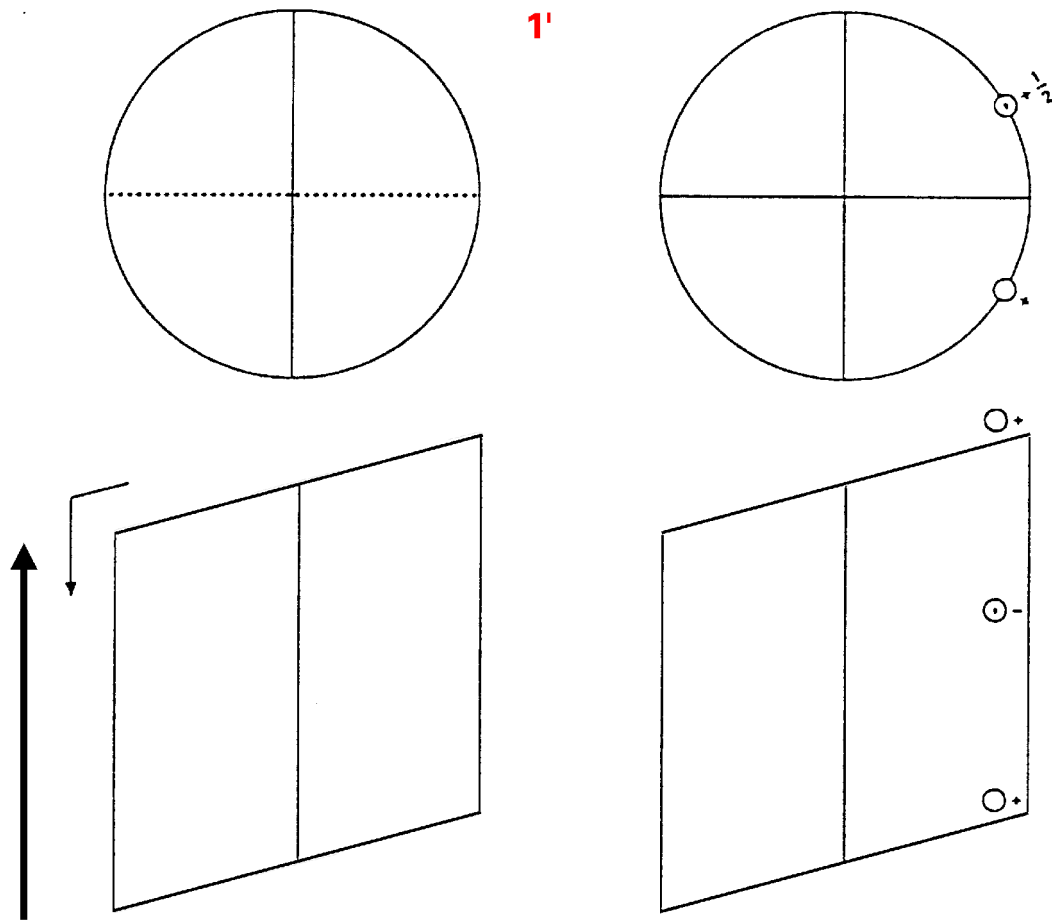
$pc111'$

$m1'$

Monoclinic/Oblique

No. 5.2.18

$pc111'$



Origin on glide plane $c1'$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

(1) 1	(2) $c (0,0,1/2) \ 0,y,z$
$(1 0,0,0)$	$(m_x 0,0,1/2)$

For $1' +$ set

(1) $1'$	(2) $c' (0,0,1/2) \ 0,y,z$
$(1 0,0,0)'$	$(m_x 0,0,1/2)'$

Generators selected (1); $t(0,0,1)$; (2); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	$1' +$
2 a $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},y,z+1/2 [0,0,0]$

Symmetry of special projections

Along $[001]$ $1m11'$	Along $[100]$ $p11'$	Along $[010]$ $p11g1'$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c_p$ Origin at $0,y,0$

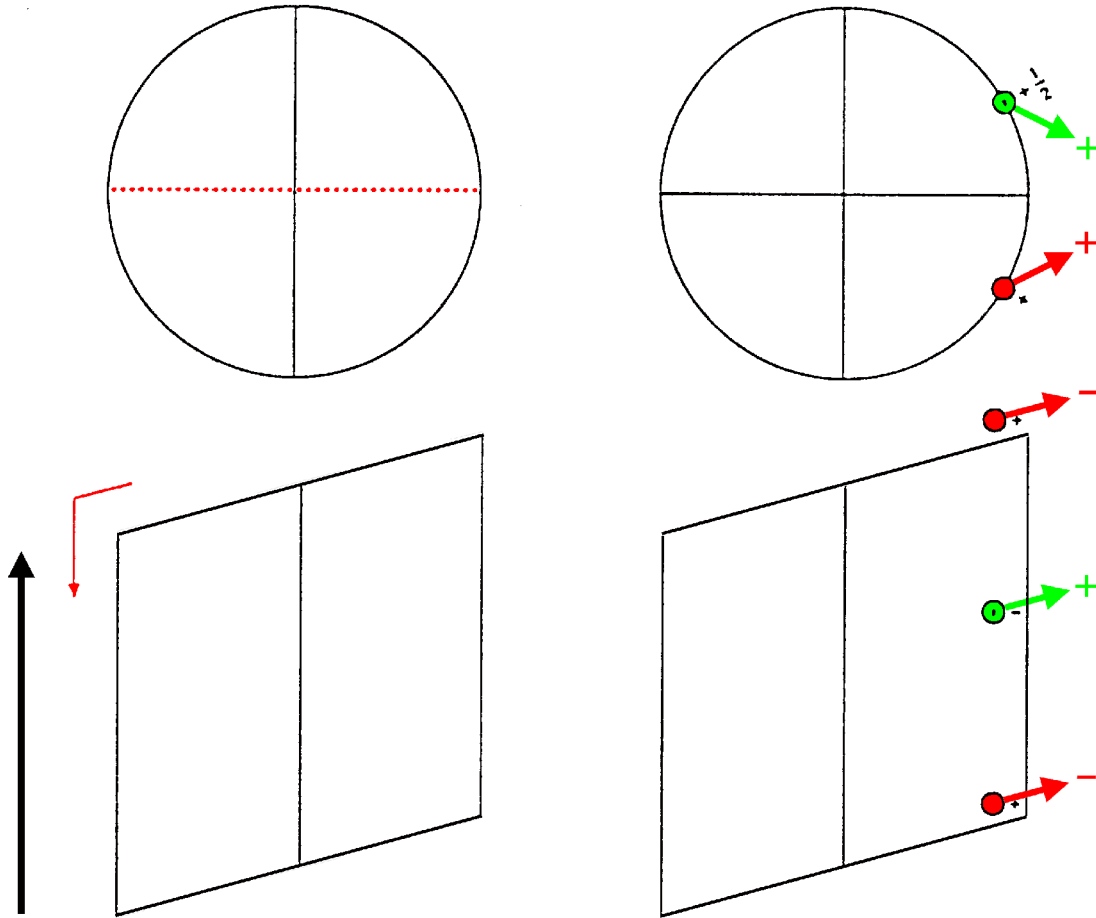
$pc'11$

No. 5.3.19

m'

$pc'11$

Monoclinic/Oblique



Origin on glide plane c'

Asymmetric unit $0 \leq x; 0 \leq z \leq 1$

Symmetry operations

- (1) 1 (2) $c' (0,0,1/2)$ $0,y,z$
 $(1|0,0,0)$ $(m_x|0,0,1/2)'$

Generators selected (1); $t(0,0,1)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 a 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,z+1/2 [\bar{u},v,w]$

Symmetry of special projections

Along [001] $1m'$ Origin at 0,0,z	Along [100] $p1$ $a^* = c/2$ Origin at x,0,0	Along [010] $p11g'$ $a^* = c_p$ Origin at 0,y,0
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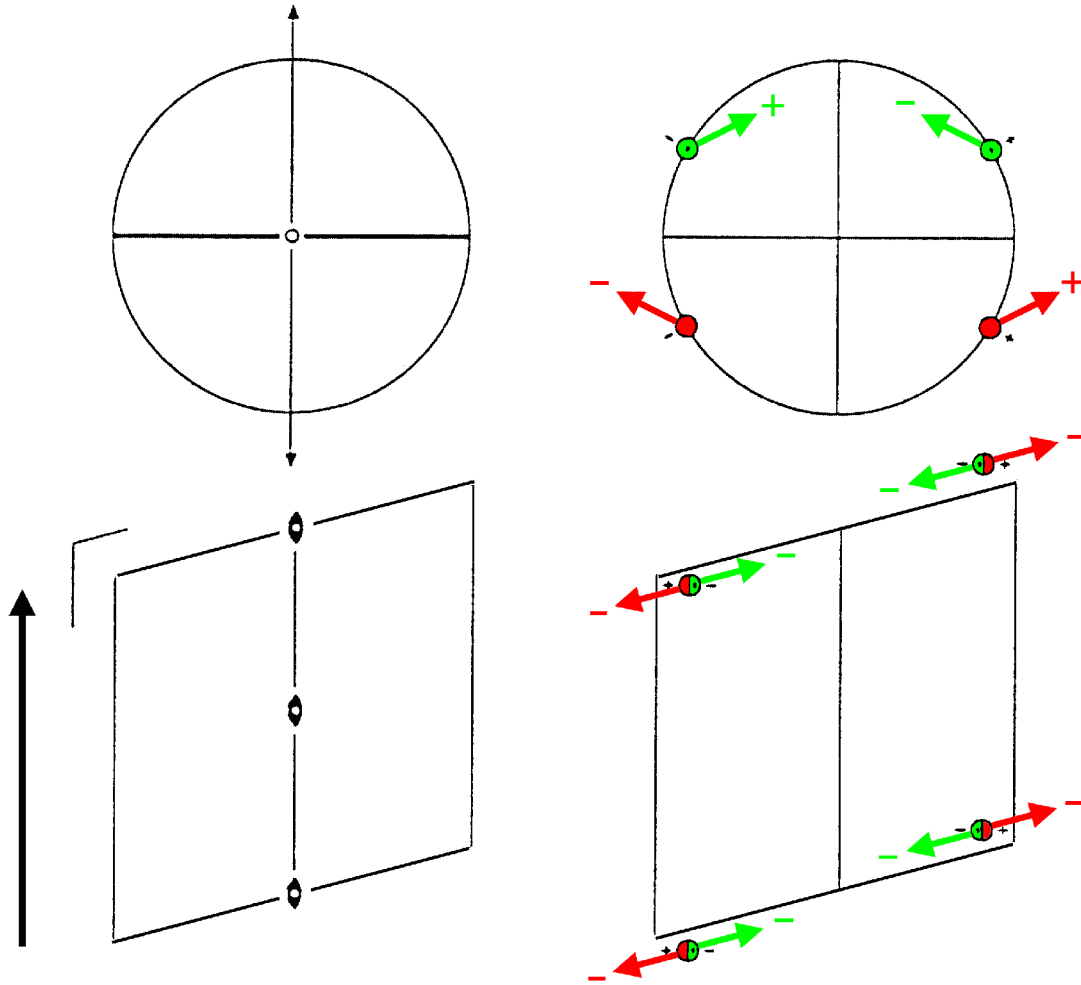
$p2/m11$

No. 6.1.20

$2/m$

$p2/m11$

Monoclinic/Oblique



Origin at center $2/m$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1
 - (2) $2 \quad x,0,0$
 - (3) $\bar{1} \quad 0,0,0$
 - (4) $m \quad 0,y,z$
- (1|0,0,0) (2_x|0,0,0) ($\bar{1}$ |0,0,0) (m_x|0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
4 f 1	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) \bar{x},y,z [u, \bar{v} , \bar{w}]
2 e m	0,y,z [u,0,0]	0, \bar{y} , \bar{z} [u,0,0]
2 d 2	x,0,1/2 [u,0,0]	\bar{x} ,0,1/2 [u,0,0]
2 c 2	x,0,0 [u,0,0]	\bar{x} ,0,0 [u,0,0]
1 b 2/m	0,0,1/2 [u,0,0]	
1 a 2/m	0,0,0 [u,0,0]	

Symmetry of special projections

Along [001] 2'mm'	Along [100] p2111'	Along [010] p2'm'm
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}_p$ Origin at 0,y,0

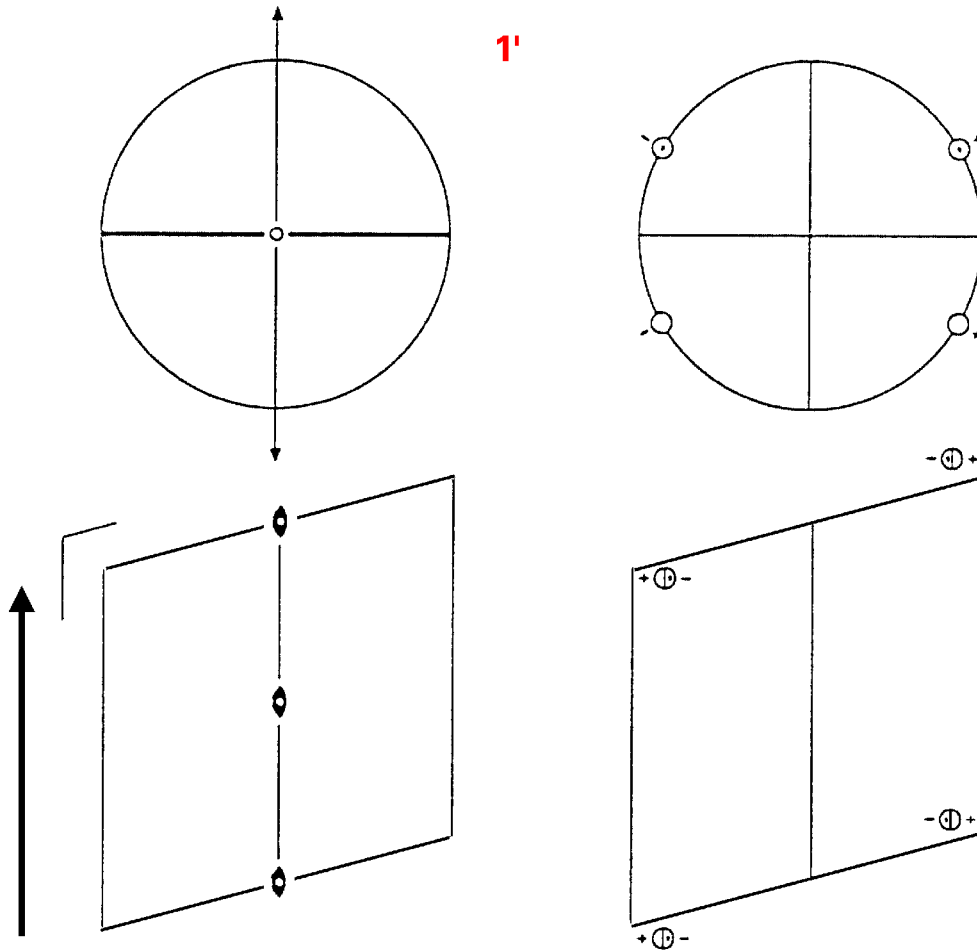
$p2/m111'$

$2/m1'$

Monoclinic/Oblique

No. 6.2.21

$p2/m111'$



Origin at center $2/m1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

(1) 1	(2) $2 \quad x,0,0$	(3) $\bar{1} \quad 0,0,0$	(4) $m \quad 0,y,z$
$(1 0,0,0)$	$(2_x 0,0,0)$	$(\bar{1} 0,0,0)$	$(m_x 0,0,0)$

For $1' +$ set

(1) $1'$	(2) $2' \quad x,0,0$	(3) $\bar{1}' \quad 0,0,0$	(4) $m' \quad 0,y,z$
$(1 0,0,0)'$	$(2_x 0,0,0)'$	$(\bar{1} 0,0,0)'$	$(m_x 0,0,0)'$

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [0,0,0]	(2) x,\bar{y},\bar{z} [0,0,0]
4 f $11'$	(3) \bar{x},\bar{y},\bar{z} [0,0,0]	(4) \bar{x},y,z [0,0,0]
2 e $m1'$	$0,y,z$ [0,0,0]	$0,\bar{y},\bar{z}$ [0,0,0]
2 d $21'$	$x,0,1/2$ [0,0,0]	$\bar{x},0,1/2$ [0,0,0]
2 c $21'$	$x,0,0$ [0,0,0]	$\bar{x},0,0$ [0,0,0]
1 b $2/m1'$	$0,0,1/2$ [0,0,0]	
1 a $2/m1'$	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p2111'$	Along [010] $p2mm1'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

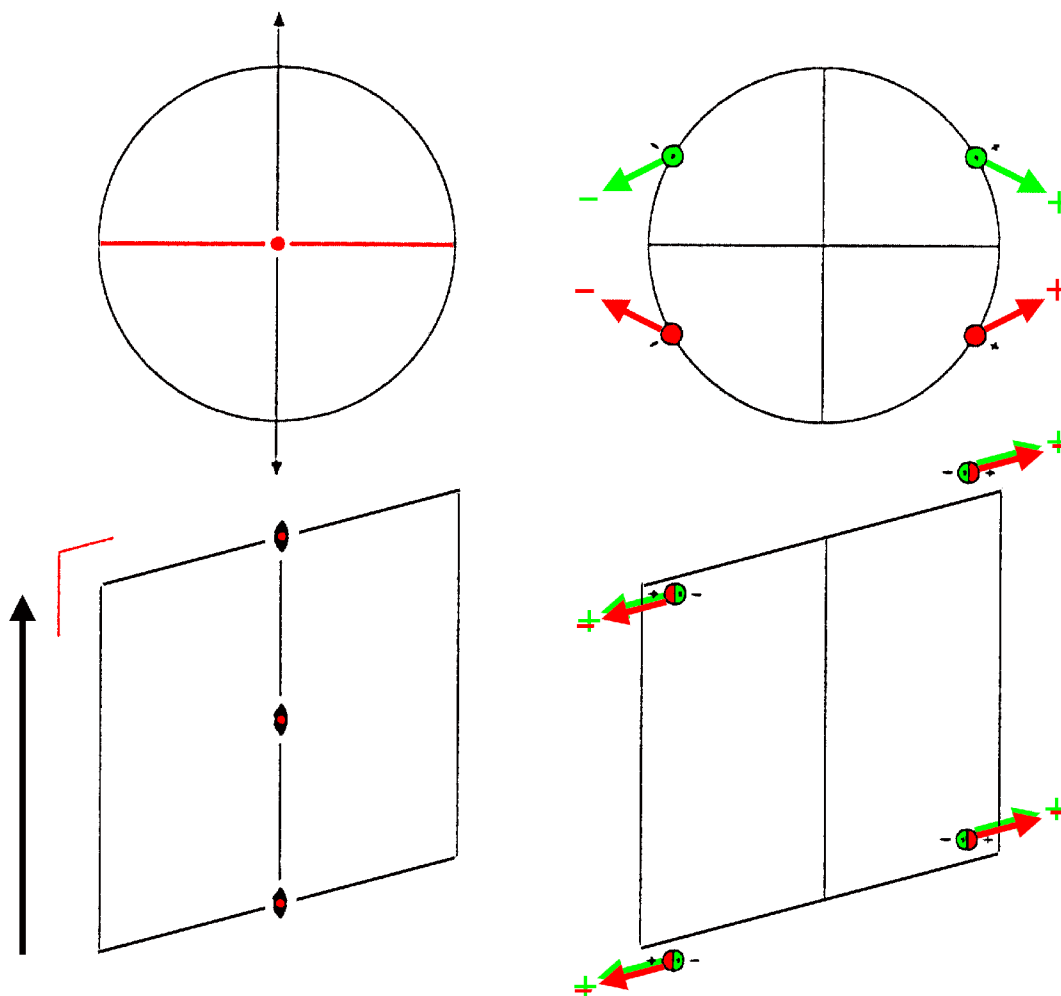
$p2/m'11$

No. 6.3.22

$2/m'$

$p2/m'11$

Monoclinic/Oblique



Origin at center $2/m'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1 (2) $2_x | 0,0,0$ (3) $\bar{1} | 0,0,0$ (4) $m'_y | 0,y,z$
 (1|0,0,0) (2_x|0,0,0) ($\bar{1}$ |0,0,0) (m'_x |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]
4 f 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]
	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) \bar{x},y,z [\bar{u},v,w]
2 e m'	$0,y,z$ [$0,v,w$]	$0,\bar{y},\bar{z}$ [$0,\bar{v},\bar{w}$]
2 d 2	$x,0,1/2$ [$u,0,0$]	$\bar{x},0,1/2$ [$\bar{u},0,0$]
2 c 2	$x,0,0$ [$u,0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]
1 b $2/m'$	$0,0,1/2$ [$0,0,0$]	
1 a $2/m'$	$0,0,0$ [$0,0,0$]	

Symmetry of special projections

Along [001] $2m'm'$	Along [100] $p211$	Along [010] $p2m'm'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c_p$ Origin at $0,y,0$

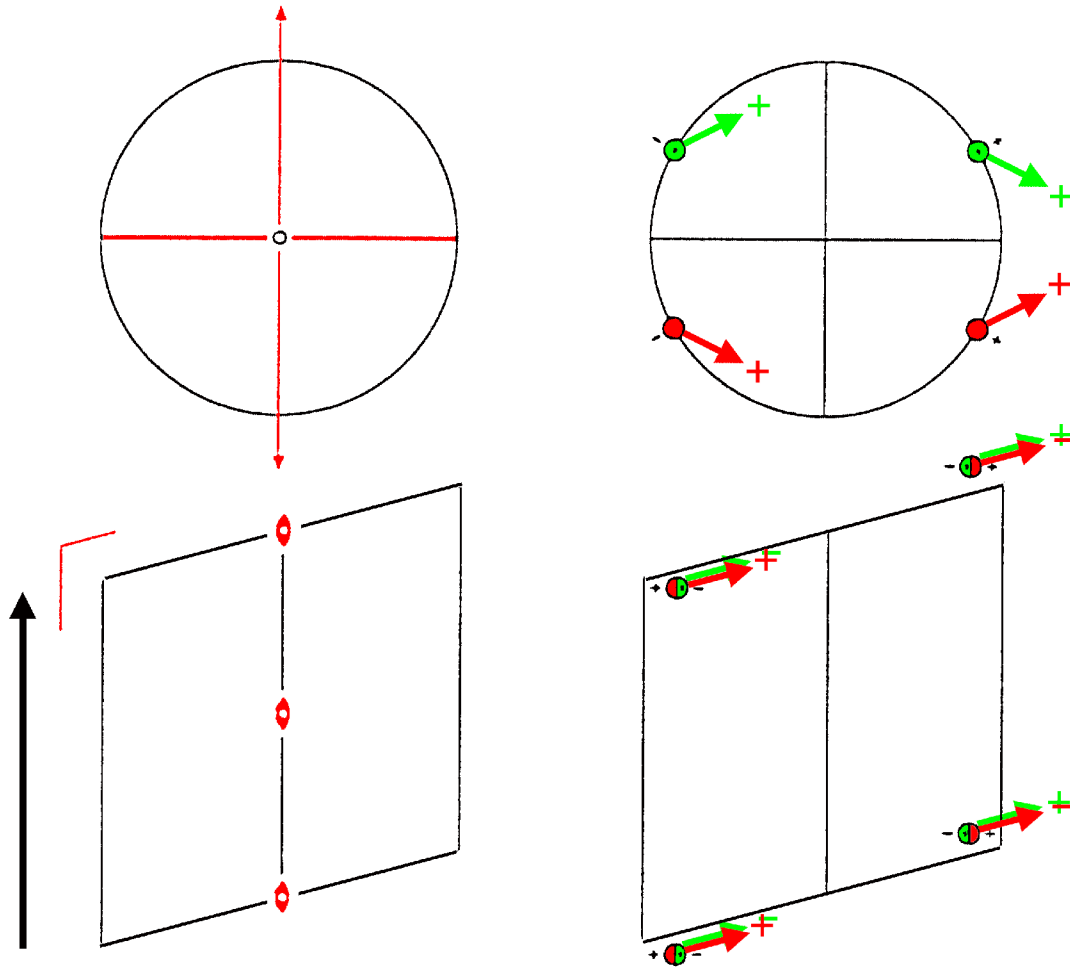
$p2'/m'11$

No. 6.4.23

$2'/m'$

$p2'/m'11$

Monoclinic/Oblique



Origin at center $2'/m'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- | | | | |
|---------------|-----------------------|-------------------------|-----------------------|
| (1) 1 | (2) $2'_x$ $x,0,0$ | (3) $\bar{1}$ $0,0,0$ | (4) m'_y $0,y,z$ |
| (1 $0,0,0$) | ($2'_x$ $0,0,0$)' | ($\bar{1}$ $0,0,0$) | (m'_y $0,0,0$)' |

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u} ,v,w]
4 f 1	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) \bar{x},y,z [\bar{u} ,v,w]
2 e m'	$0,y,z$ [0,v,w]	$0,\bar{y},\bar{z}$ [0,v,w]
2 d $2'$	$x,0,1/2$ [0,v,w]	$\bar{x},0,1/2$ [0,v,w]
2 c $2'$	$x,0,0$ [0,v,w]	$\bar{x},0,0$ [0,v,w]
1 b $2'/m'$	$0,0,1/2$ [0,v,w]	
1 a $2'/m'$	$0,0,0$ [0,v,w]	

Symmetry of special projections

Along [001] $2'm'm$	Along [100] $p2'11$	Along [010] $p2'mm'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

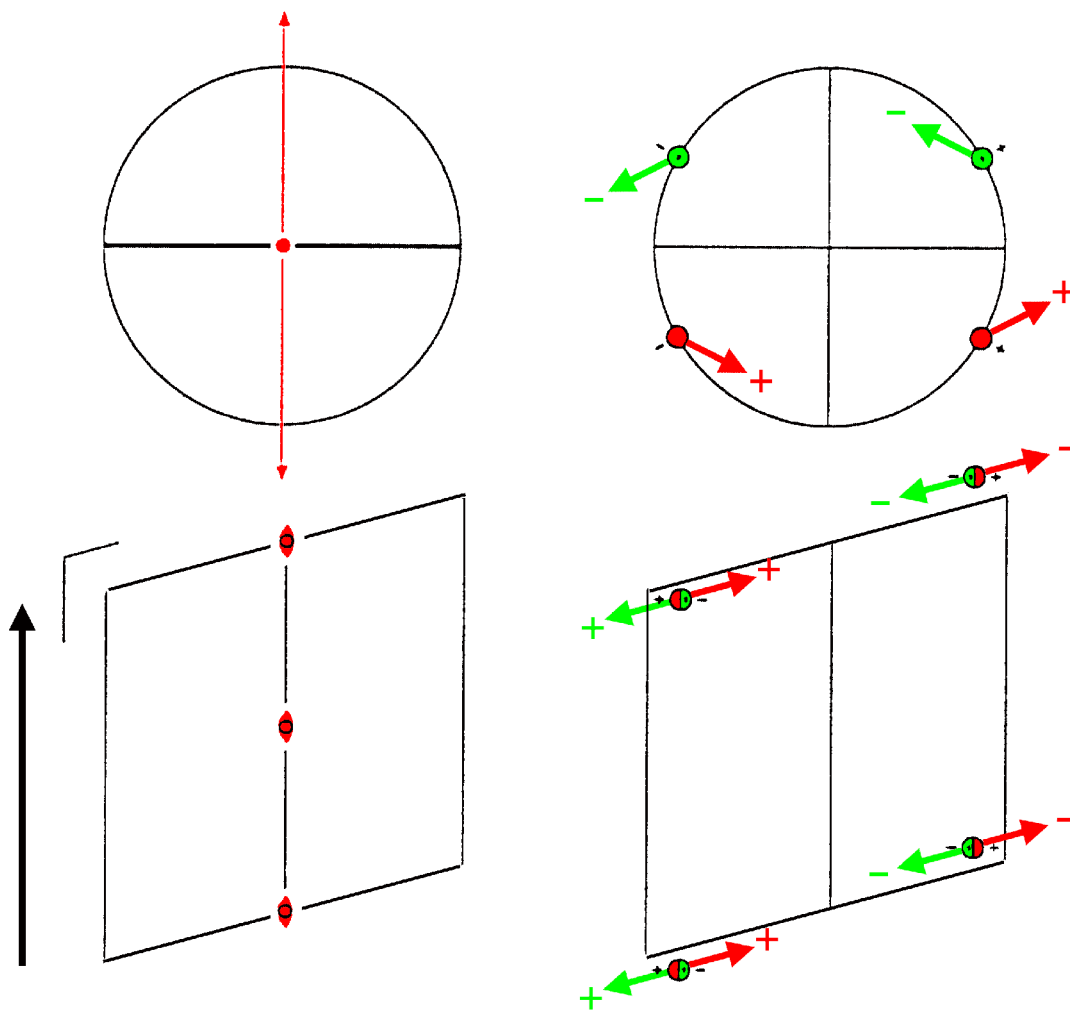
$p2'/m11$

No. 6.5.24

$2'/m$

$p2'/m11$

Monoclinic/Oblique



Origin at center $2'/m$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- | | | | |
|-----------|--------------------|------------------------|-----------------|
| (1) 1 | (2) $2'_x$ $x,0,0$ | (3) $\bar{1}'$ $0,0,0$ | (4) m $0,y,z$ |
| (1 0,0,0) | ($2'_x$ 0,0,0)' | ($\bar{1}$ 0,0,0)' | (m_x 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]
4 f 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]
	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) \bar{x},y,z [u,\bar{v},\bar{w}]
2 e m	$0,y,z$ [u,0,0]	$0,\bar{y},\bar{z}$ [$\bar{u},0,0$]
2 d 2'	$x,0,1/2$ [0,v,w]	$\bar{x},0,1/2$ [0, \bar{v},\bar{w}]
2 c 2'	$x,0,0$ [0,v,w]	$\bar{x},0,0$ [0, \bar{v},\bar{w}]
1 b 2'/m	$0,0,1/2$ [0,0,0]	
1 a 2'/m	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] $2mm$	Along [100] $p2111'$	Along [010] $p2mm$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

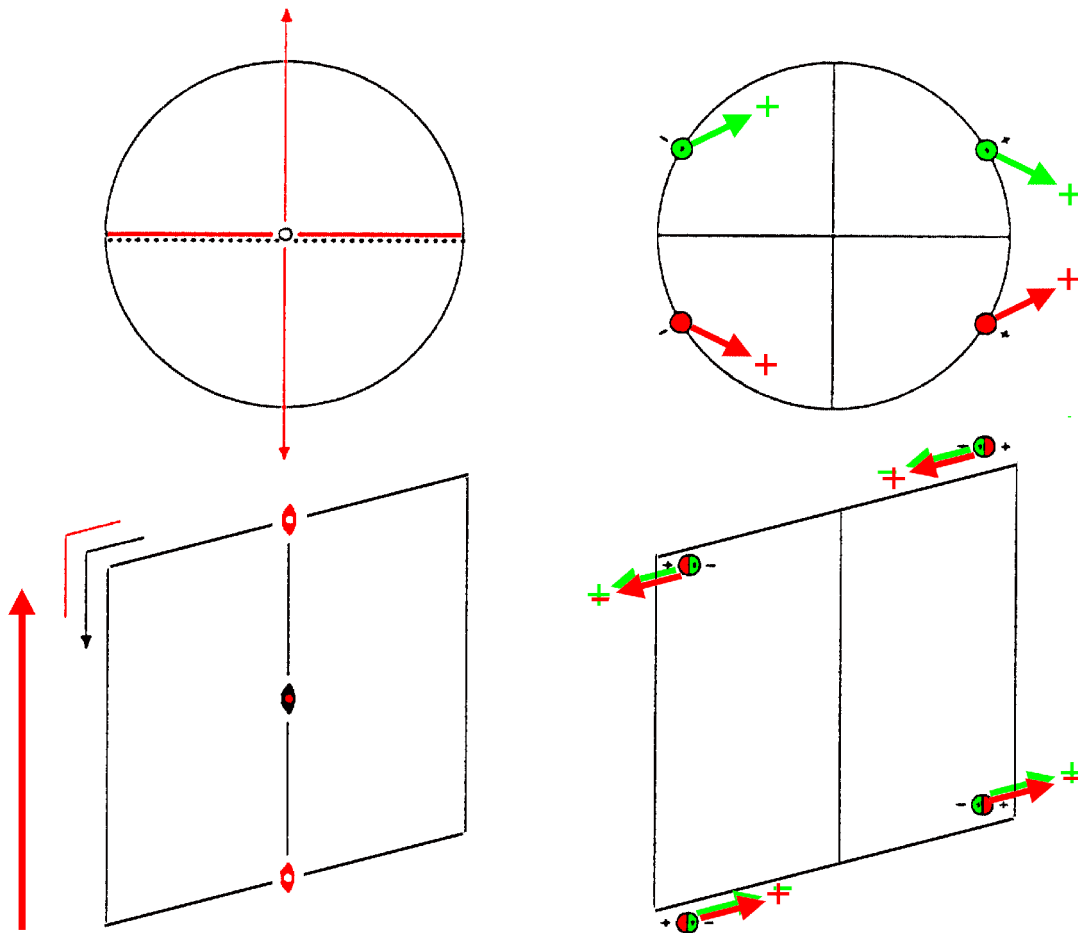
$p_{2c}2'/m'11$

$2/m1'$

Monoclinic/Oblique

No. 6.6.25

$p_{2c}2'/m'11$



Origin at center $2'/m'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2' \ x,0,0$	(3) $\bar{1} \ 0,0,0$	(4) $m' \ 0,y,z$
(1 0,0,0)	(2 _x 0,0,0)'	($\bar{1}$ 0,0,0)	(m_x 0,0,0)'

For $(0,0,1)'$ + set

(1) $t' \ (0,0,1)$	(2) $2 \ x,0,1/2$	(3) $\bar{1} \ 0,0,1/2$	(4) $c \ (0,0,1) \ 0,y,z$
(1 0,0,1)'	(2 _x 0,0,1)	($\bar{1}$ 0,0,1)'	(m_x 0,0,1)

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		(0,0,0)+ (0,0,1)' +
4 f 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
2 e m'	$0,y,z [0,v,w]$	$0,\bar{y},\bar{z} [0,v,w]$
2 d 2	$x,0,1/2 [u,0,0]$	$\bar{x},0,1/2 [\bar{u},0,0]$
2 c 2'	$x,0,0 [0,v,w]$	$\bar{x},0,0 [0,v,w]$
1 b $2/m'$	$0,0,1/2 [0,0,0]$	
1 a $2'/m'$	$0,0,0 [0,v,w]$	

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $\rho_{2a^*}211$	Along [010] $\rho_{2a^*}2mm$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

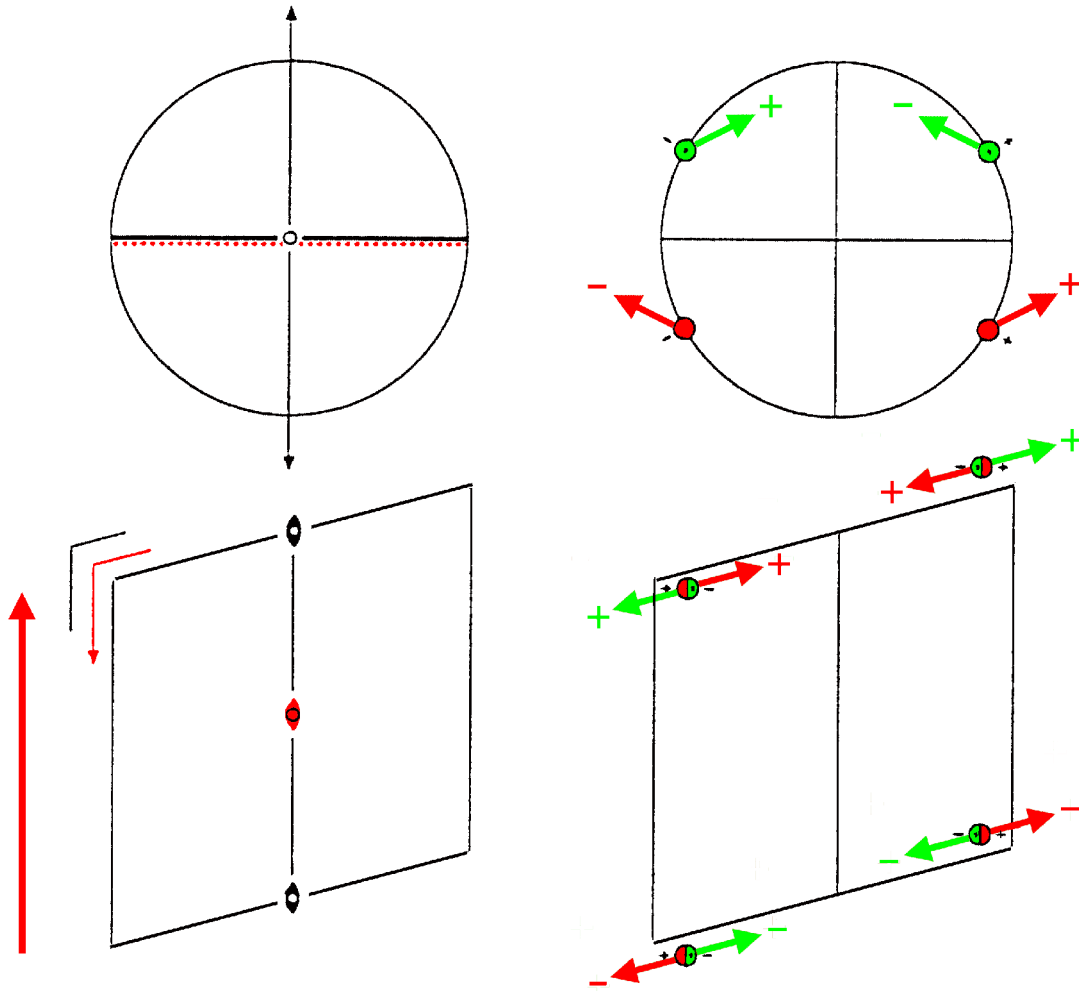
$p_{2c}2/m11$

No. 6.7.26

$2/m1'$

$p_{2c}2/m11$

Monoclinic/Oblique



Origin at center $2/m$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0) +$ set

(1) 1	(2) 2_x $x,0,0$	(3) $\bar{1}$ $0,0,0$	(4) m $0,y,z$
$(1 0,0,0)$	$(2_x 0,0,0)$	$(\bar{1} 0,0,0)$	$(m_x 0,0,0)$

For $(0,0,1)'$ + set

(1) t' $(0,0,1)$	(2) $2'_x$ $x,0,1/2$	(3) $\bar{1}'$ $0,0,1/2$	(4) c' $(0,0,1)$ $0,y,z$
$(1 0,0,1)'$	$(2'_x 0,0,1)'$	$(\bar{1}' 0,0,1)'$	$(m_x 0,0,1)'$

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		$(0,0,0)+$ $(0,0,1)'+$
4 f 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) \bar{x},y,z [u, \bar{v} , \bar{w}]
2 e m	$0,y,z$ [u,0,0]	$0,\bar{y},\bar{z}$ [u,0,0]
2 d 2'	$x,0,1/2$ [0,v,w]	$\bar{x},0,1/2$ [0, \bar{v} , \bar{w}]
2 c 2	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [u,0,0]
1 b 2'/m	$0,0,1/2$ [0,0,0]	
1 a 2/m	$0,0,0$ [u,0,0]	

Symmetry of special projections

Along [001] $2mm'$	Along [100] $p2111'$	Along [010] $p_{2a}2'm'm$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

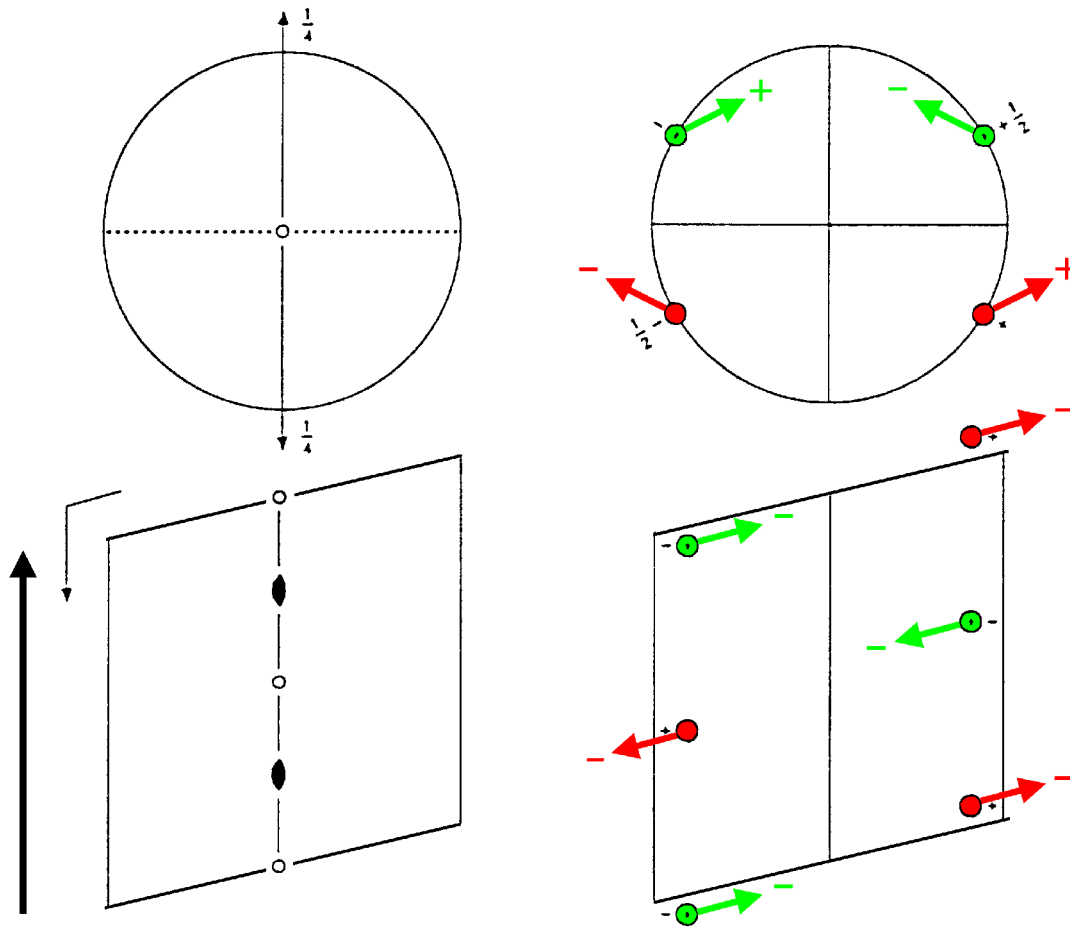
$p2/c11$

$2/m$

Monoclinic/Oblique

No. 7.1.27

$p2/c11$



Origin at $\bar{1}$ on glide plane c

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- | | | | |
|-------------|-------------------------|-------------------|-------------------------|
| (1) 1 | (2) 2_x | (3) $\bar{1}$ | (4) c |
| $(1 0,0,0)$ | $(2_x 0,0,\frac{1}{2})$ | $(\bar{1} 0,0,0)$ | $(c 0,0,\frac{1}{2})$ |
| | | | $(m_x 0,0,\frac{1}{2})$ |

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
4 c 1	(1)	x,y,z [u,v,w]	(2) $x,\bar{y},\bar{z}+1/2$ [u, \bar{v} , \bar{w}]
	(3)	\bar{x},\bar{y},\bar{z} [u,v,w]	(4) $\bar{x},y,z+1/2$ [u, \bar{v} , \bar{w}]
	2 b 2	$x,0,1/4$ [u,0,0]	$\bar{x},0,3/4$ [u,0,0]
	2 a $\bar{1}$	$0,0,0$ [u,v,w]	$0,0,1/2$ [u, \bar{v} , \bar{w}]

Symmetry of special projections

Along [001] $2'mm'$	Along [100] $p_{2a^*}211$	Along [010] $p2'm'g$
Origin at 0,0,z	$a^* = c/2$ Origin at $x,0,1/4$	$a^* = c_p$ Origin at 0,y,0

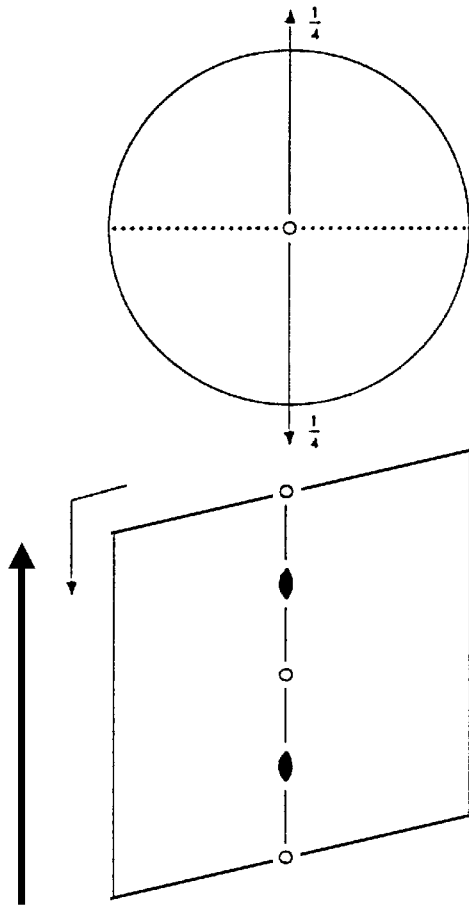
$p2/c111'$

No. 7.2.28

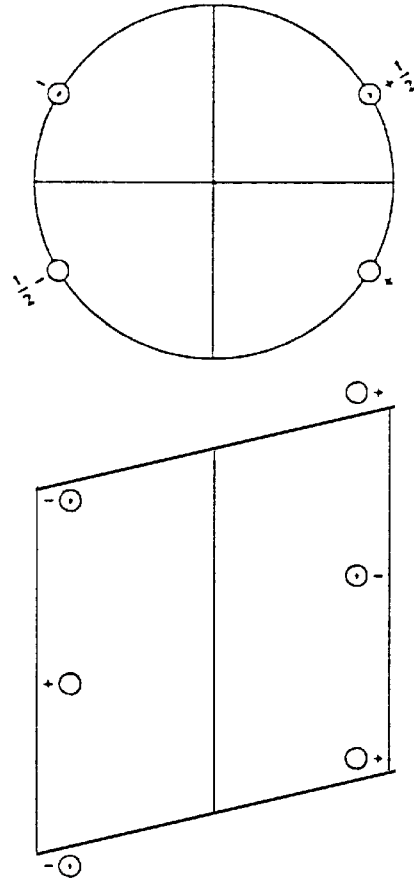
$2/m1'$

$p2/c111'$

Monoclinic/Oblique



$1'$



Origin at $\bar{1}1'$ on glide plane $c1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

(1) 1	(2) $2 \quad x, 0, 1/4$	(3) $\bar{1} \quad 0, 0, 0$	(4) $c \quad (0, 0, 1/2) \quad 0, y, z$
$(1 0, 0, 0)$	$(2_x 0, 0, 1/2)$	$(\bar{1} 0, 0, 0)$	$(m_x 0, 0, 1/2)$

For $1' +$ set

(1) $1'$	(2) $2' \quad x, 0, 1/4$	(3) $\bar{1}' \quad 0, 0, 0$	(4) $c' \quad (0, 0, 1/2) \quad 0, y, z$
$(1 0, 0, 0)'$	$(2_x 0, 0, 1/2)'$	$(\bar{1}' 0, 0, 0)'$	$(m_x 0, 0, 1/2)'$

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		$1+$ $1'+$
4 c $11'$	(1) x,y,z [0,0,0]	(2) $x,\bar{y},\bar{z}+1/2$ [0,0,0]
	(3) \bar{x},\bar{y},\bar{z} [0,0,0]	(4) $\bar{x},y,z+1/2$ [0,0,0]
2 b $21'$	$x,0,1/4$ [0,0,0]	$\bar{x},0,3/4$ [0,0,0]
2 a $\bar{1}1'$	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p2111'$	Along [010] $p2mg1'$
Origin at 0,0,z	$a^* = c/2$ Origin at $x,0,0$	$a^* = c_p$ Origin at $0,y,0$

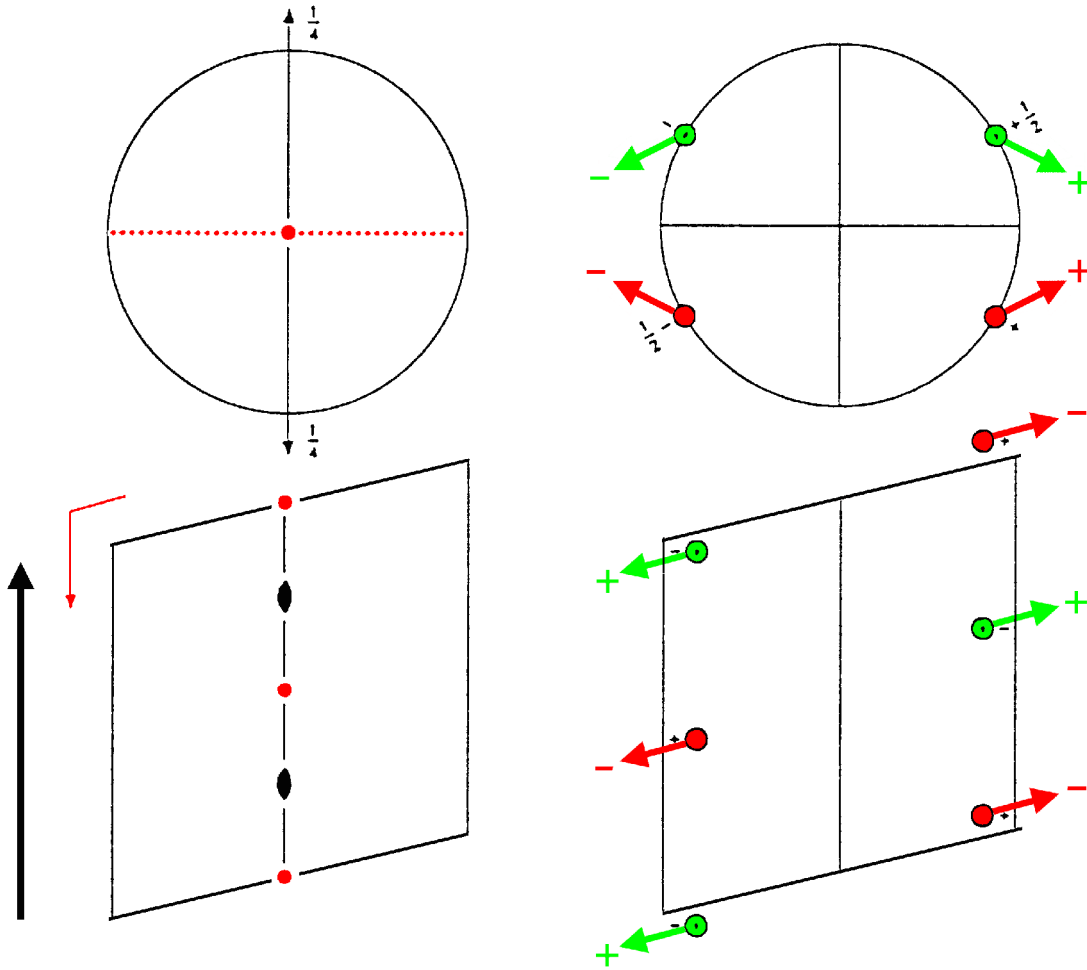
$p2/c'11$

$2/m'$

Monoclinic/Oblique

No. 7.3.29

$p2/c'11$



Origin at $\bar{1}$ on glide plane c'

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1 (2) $2_x | 0,0,1/4$ (3) $\bar{1} | 0,0,0$ (4) $c' | (0,0,1/2) | 0,y,z$
 (1|0,0,0) (2_x|0,0,1/2) ($\bar{1}$ |0,0,0)' (m_x |0,0,1/2)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $x,\bar{y},\bar{z}+1/2$ [u,\bar{v},\bar{w}]
4 c 1	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) $\bar{x},y,z+1/2$ [\bar{u},v,w]
2 b 2	$x,0,1/4$ [$u,0,0$]	$\bar{x},0,3/4$ [$\bar{u},0,0$]
2 a $\bar{1}$ '	$0,0,0$ [$0,0,0$]	$0,0,1/2$ [$0,0,0$]

Symmetry of special projections

Along [001] $2m'm'$	Along [100] $p211$	Along [010] $p2mg$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c_p$ Origin at $0,y,0$

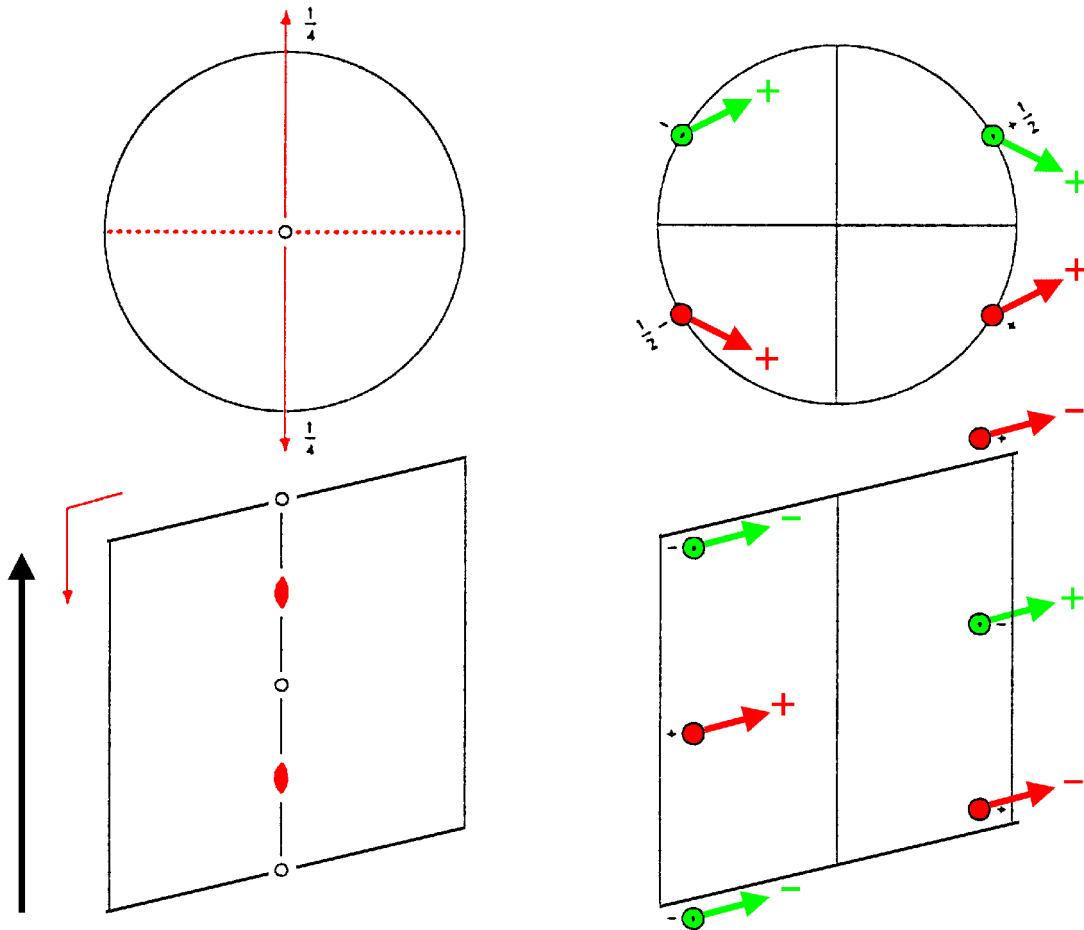
$p2'/c'11$

$2'/m'$

Monoclinic/Oblique

No. 7.4.30

$p2'/c'11$



Origin at $\bar{1}$ on glide plane c'

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1 (2) $2' \ x,0,1/4$ (3) $\bar{1} \ 0,0,0$ (4) $c' \ (0,0,1/2) \ 0,y,z$
 (1|0,0,0) (2_x|0,0,1/2)' ($\bar{1}$ |0,0,0) (m_x |0,0,1/2)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $x,\bar{y},\bar{z}+1/2$ [\bar{u},v,w]
4 c 1	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) $\bar{x},y,z+1/2$ [\bar{u},v,w]
2 b 2'	$x,0,1/4$ [0,v,w]	$\bar{x},0,3/4$ [0,v,w]
2 a $\bar{1}$	$0,0,0$ [u,v,w]	$0,0,1/2$ [\bar{u},v,w]

Symmetry of special projections

Along [001] $2'm'm$	Along [100] $p2'11$	Along [010] $p2'mg'$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

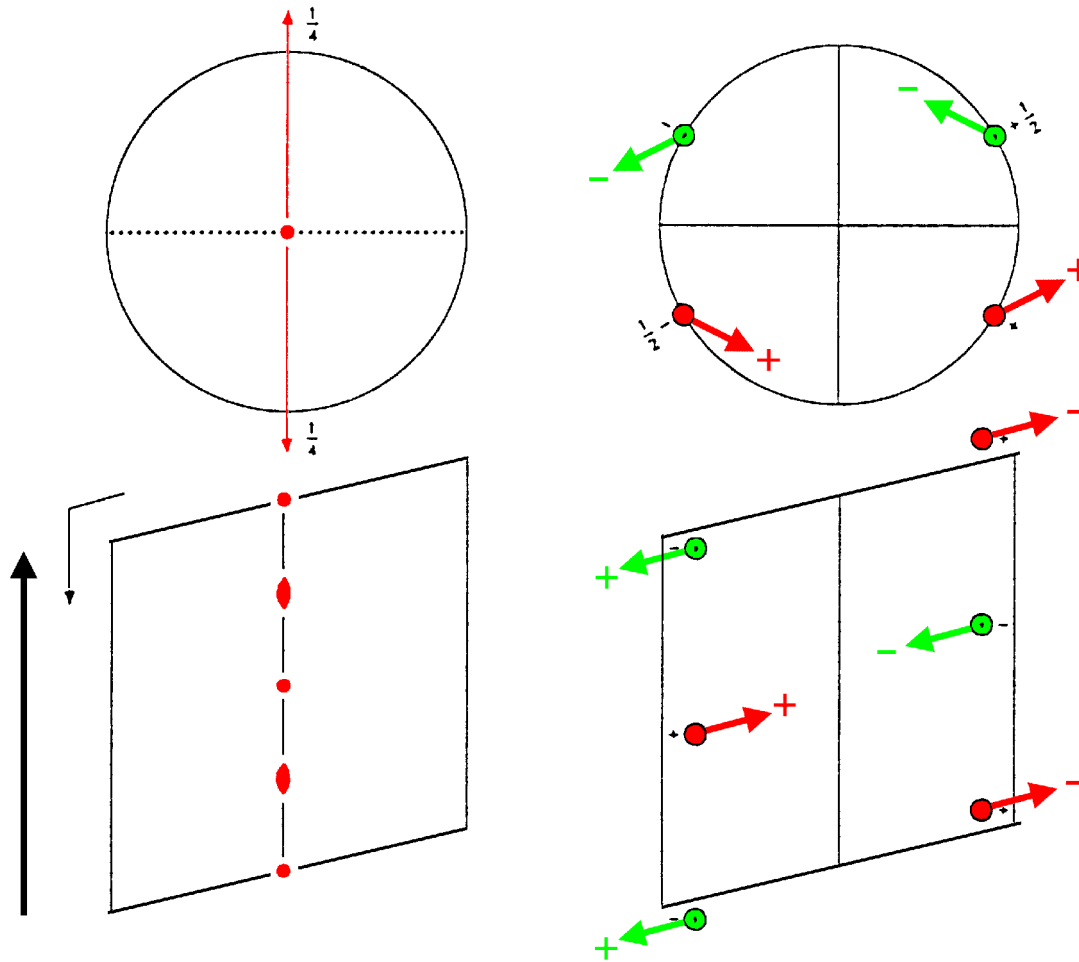
$p2'/c11$

$2'/m$

Monoclinic/Oblique

No. 7.5.31

$p2'/c11$



Origin at $\bar{1}$ on glide plane c

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1 (1|0,0,0) (2) $2'$ $x,0,1/4$ ($2_x|0,0,1/2$)' (3) $\bar{1}$ $0,0,0$ ($\bar{1}|0,0,0$)' (4) c $(0,0,1/2)$ $0,y,z$ ($m_x|0,0,1/2$)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $x,\bar{y},\bar{z}+1/2$ [\bar{u},v,w]
4 c 1	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) $\bar{x},y,z+1/2$ [u,\bar{v},\bar{w}]
2 b 2'	$x,0,1/4$ [0,v,w]	$\bar{x},0,3/4$ [0, \bar{v},\bar{w}]
2 a $\bar{1}$ '	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]

Symmetry of special projections

Along [001] 2mm	Along [100] $p_{2a^*}211$	Along [010] $p2mg$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c_p$ Origin at 0,y,0

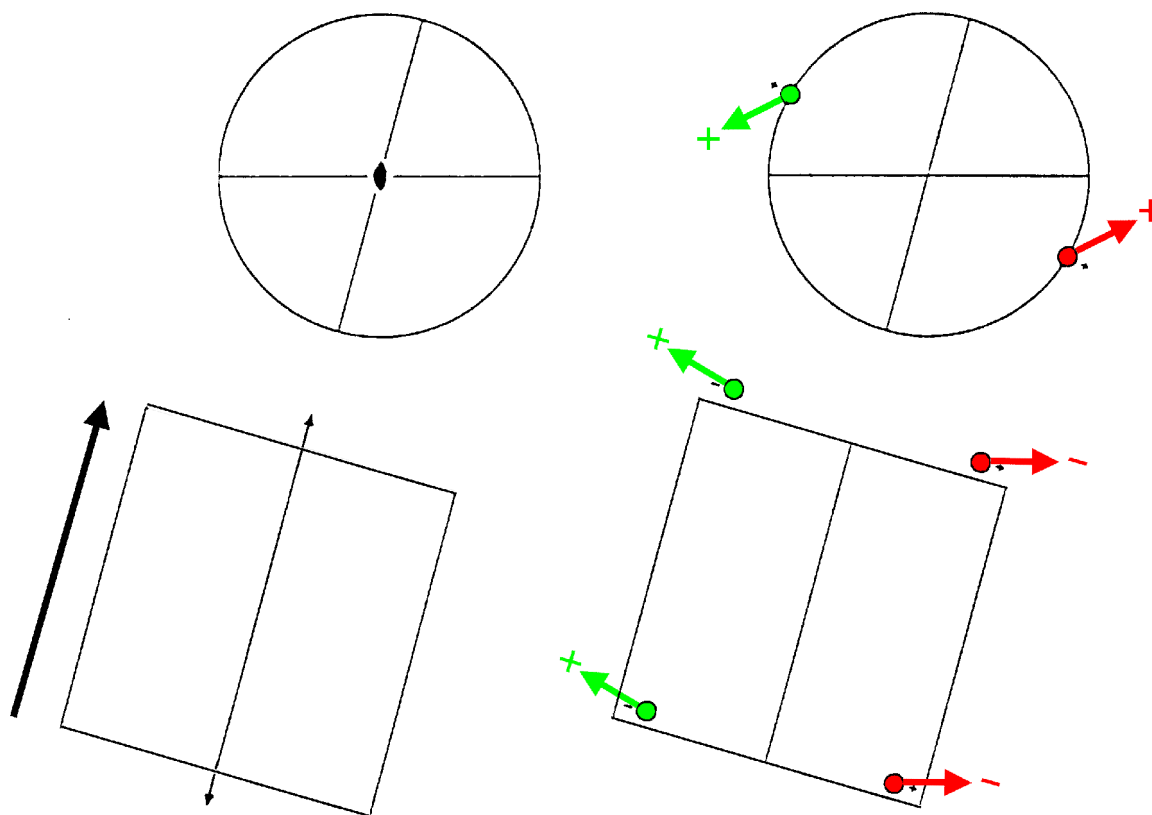
$p112$

2

Monoclinic/Rectangular

No. 8.1.32

$p112$



Origin on 2

Asymmetric unit $0 \leq x; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

Generators selected (1); $t(0,0,1)$; (2)

Positions

		Coordinates	
		Multiplicity, Wyckoff letter, Site symmetry	
2	b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
1	a 2	$0,0,z [0,0,w]$	

Symmetry of special projections

Along [001] 211	Along [100] $p11m'$ $a^* = c$	Along [010] $p11m'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

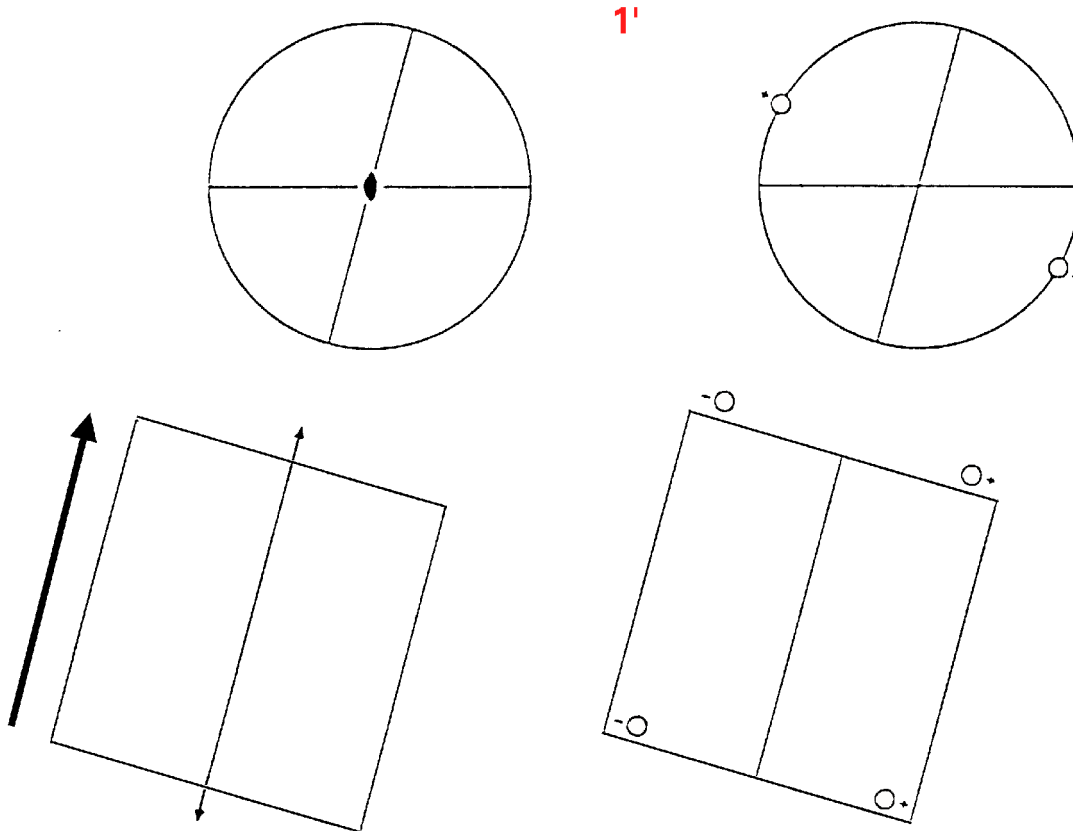
$p1121'$

$21'$

Monoclinic/Rectangular

No. 8.2.33

$p1121'$



Origin on $21'$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1$

Symmetry operations

1 + set
(1) 1 (2) $2 \ 0,0,z$
(1|0,0,0) (2_z|0,0,0)

1' + set
(1) 1' (2) $2' \ 0,0,z$
(1|0,0,0)' (2'_z|0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); $1'$

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		$1+$	$1'+$
2	$b\ 11'$	(1) $x,y,z\ [0,0,0]$	(2) $\bar{x},\bar{y},z\ [0,0,0]$
1	$a\ 21'$	$0,0,z\ [0,0,0]$	

Symmetry of special projections

Along $[001]\ 2111'$	Along $[100]\ p11m1'$	Along $[010]\ p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

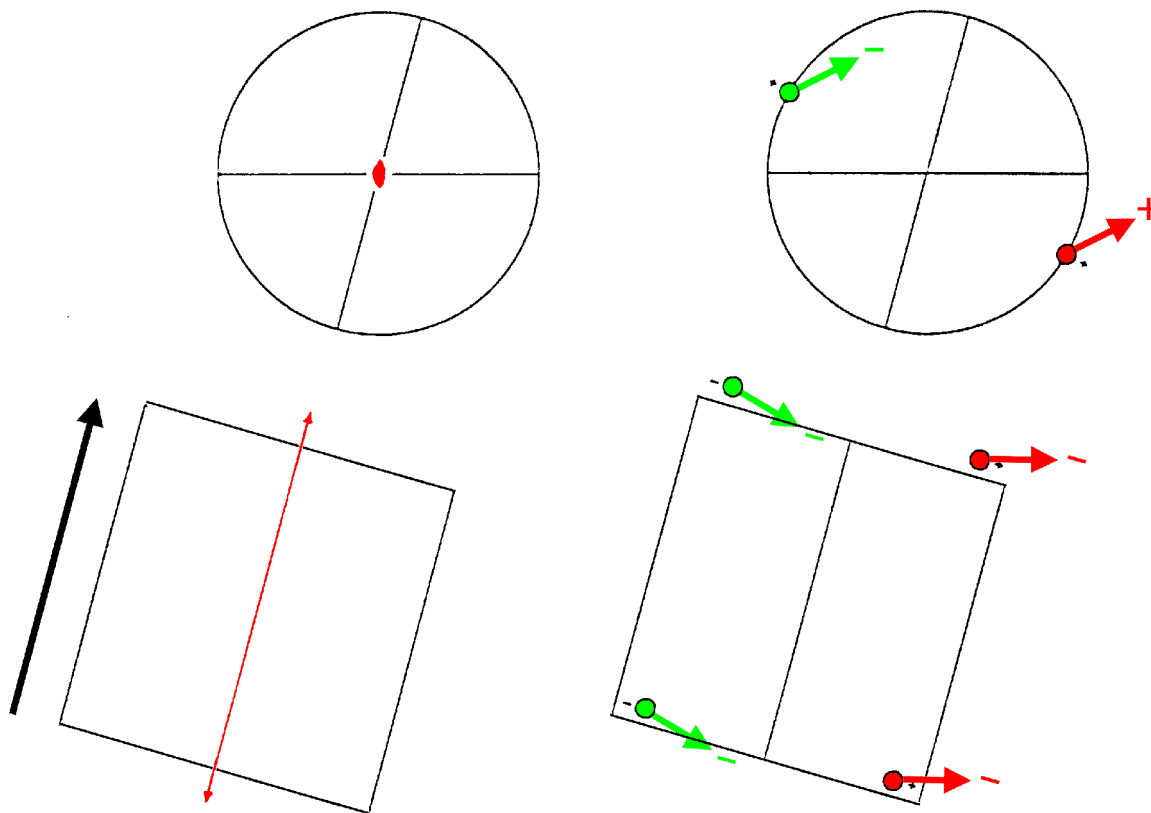
$p112'$

$2'$

Monoclinic/Rectangular

No. 8.3.34

$p112'$



Origin on $2'$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_z$ 0,0,z
($2'_z$ |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$
1 a 2'	$0,0,z [u,v,0]$	

Symmetry of special projections

Along [001] $2'11$	Along [100] $p11m$	Along [010] $p11m$
	$a^* = c$	$a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

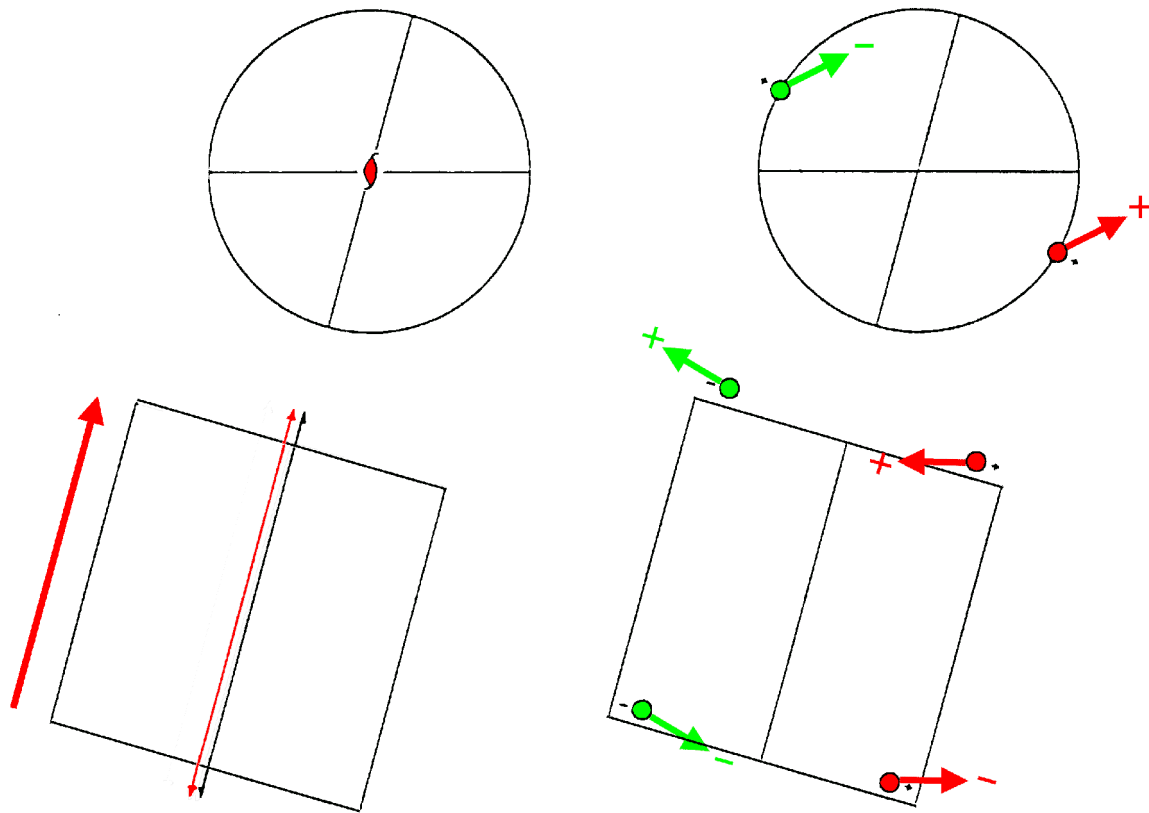
$p_{2c}112'$

$21'$

Monoclinic/Rectangular

No. 8.4.35

$p_{2c}112$



Origin on $2'$

Asymmetric unit $0 \leq x$; $0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 (2) $2' \ 0,0,z$
 (1| $0,0,0$) (2_z| $0,0,0$)'

For $(0,0,1)'$ + set
 (1) $t' \ (0,0,1)$ (2) $2 \ (0,0,1) \ 0,0,z$
 (1| $0,0,1$)' (2_z| $0,0,1$)

Generators selected (1); $t(0,0,1)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)' +
2 b 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	
1 a 2'	0,0,z [u,v,0]		

Symmetry of special projections

Along [001] $2111'$	Along [100] $P_{2a^*}11m$ $a^* = c$	Along [010] $P_{2a^*}11m$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

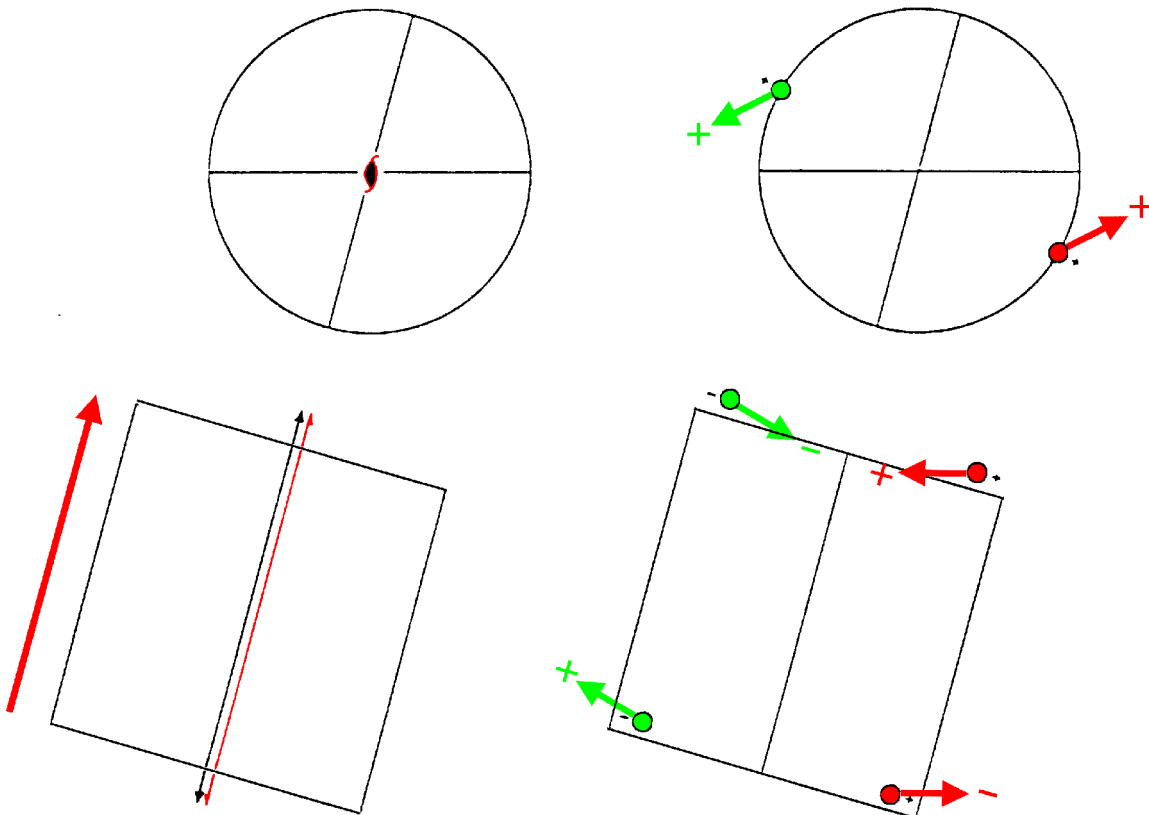
$p_{2c}112$

21'

Monoclinic/Rectangular

No. 8.5.36

$p_{2c}112$



Origin on 2

Asymmetric unit $0 \leq x; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 (2) $2 \ 0,0,z$
 (1| $0,0,0$) (2_z| $0,0,0$)

For $(0,0,1)'$ + set
 (1) $t' \ (0,0,1)$ (2) $2' \ (0,0,1) \ 0,0,z$
 (1| $0,0,1$) (2_z| $0,0,1$)'

Generators selected (1); $t(0,0,1)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)' +
2	b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
1	a 2	$0,0,z [0,0,w]$	

Symmetry of special projections

Along [001] $2111'$	Along [100] $p_{2a^*}11m'$	Along [010] $p_{2a^*}11m'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at 0,y,0

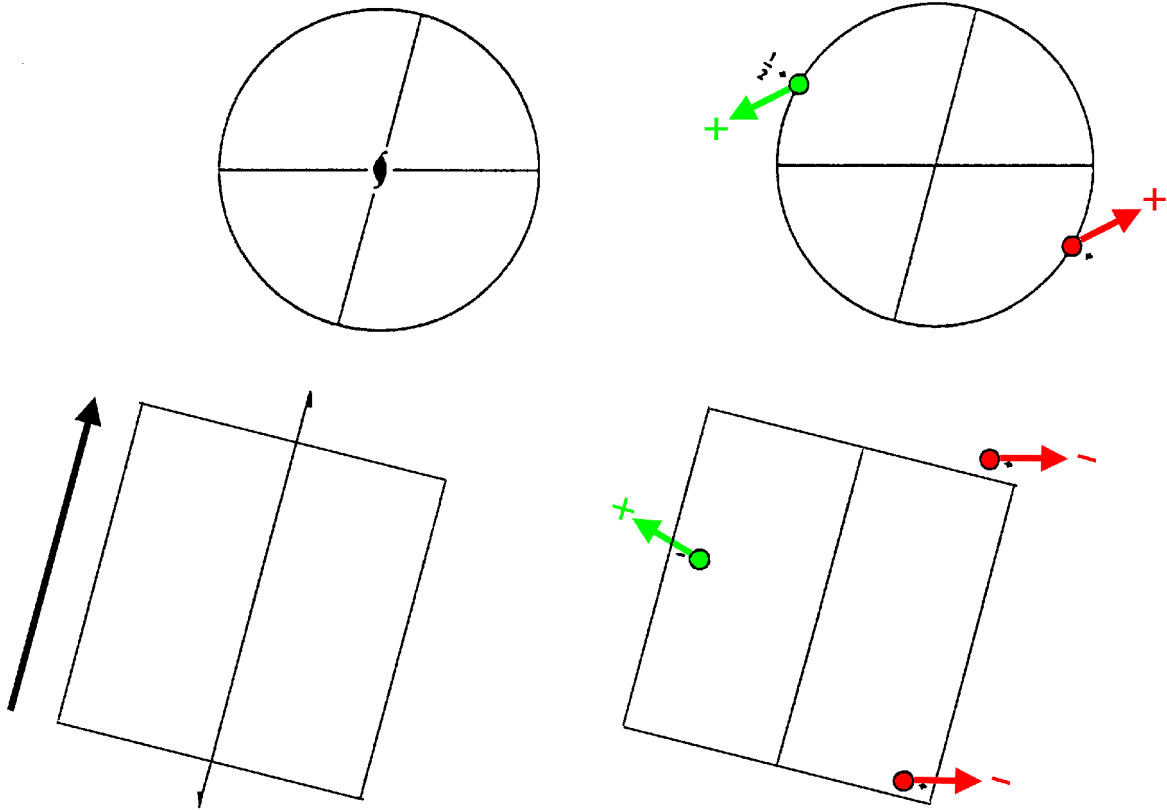
$p112_1$

2

Monoclinic/Rectangular

No. 9.1.37

$p112_1$



Origin on 2_1

Asymmetric unit $0 \leq x; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 (0,0,1/2) 0,0,z
(2_z|0,0,1/2)

Generators selected (1); $t(0,0,1)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 a 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z+1/2 [\bar{u},\bar{v},w]$

Symmetry of special projections

Along [001] 211	Along [100] $p11g'$ $a^* = c$	Along [010] $p11g$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

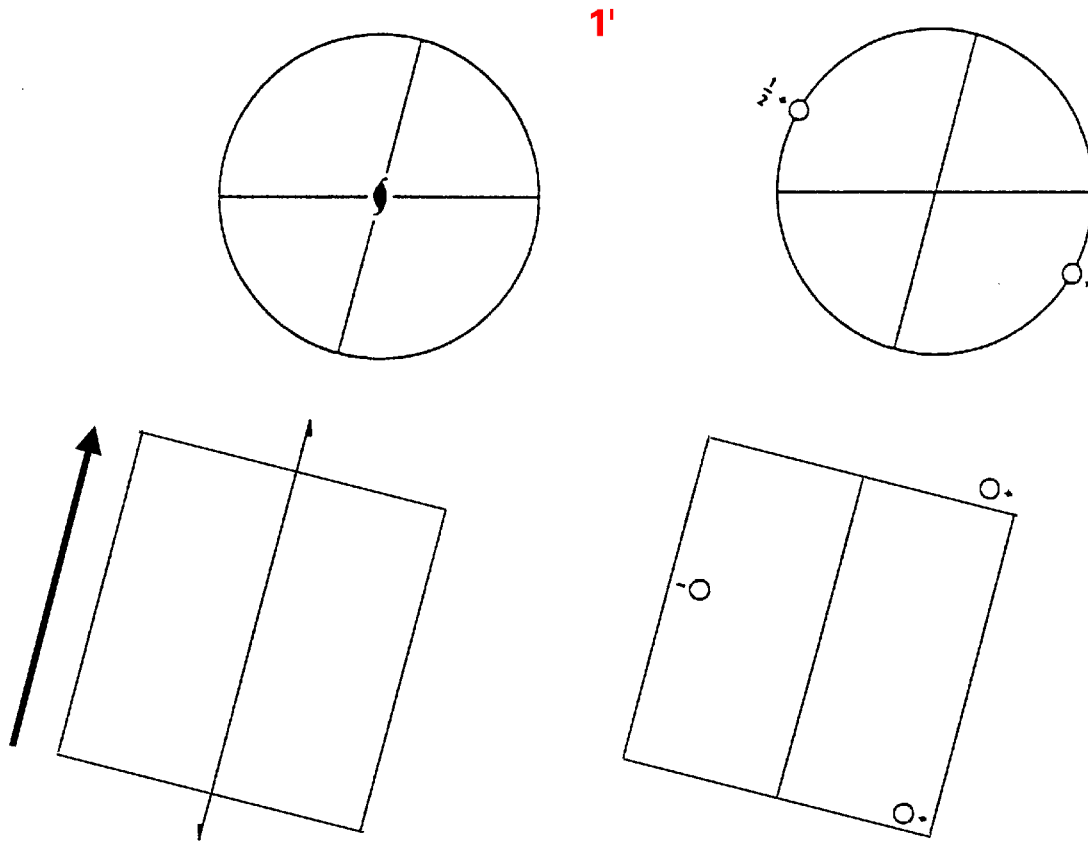
$p112_11'$

$21'$

Monoclinic/Rectangular

No. 9.2.38

$p112_11'$



Origin on $2_11'$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1$

Symmetry operations

1 + set
 (1) 1 (2) 2 (0,0,½) 0,0,z
 (1|0,0,0) (2_z|0,0,½)

1' + set
 (1) 1' (2) 2' (0,0,½) 0,0,z
 (1|0,0,0)' (2_z|0,0,½)'

Continued

No. 9.2.38

$p112_11'$

Generators selected (1); $t(0,0,1)$; (2); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
2 a 11'	(1) x,y,z [0,0,0]	(2) $\bar{x},\bar{y},z+1/2$ [0,0,0]

Symmetry of special projections

Along [001] $2111'$	Along [100] $p11g1'$	Along [010] $p11g1'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at 0,y,0

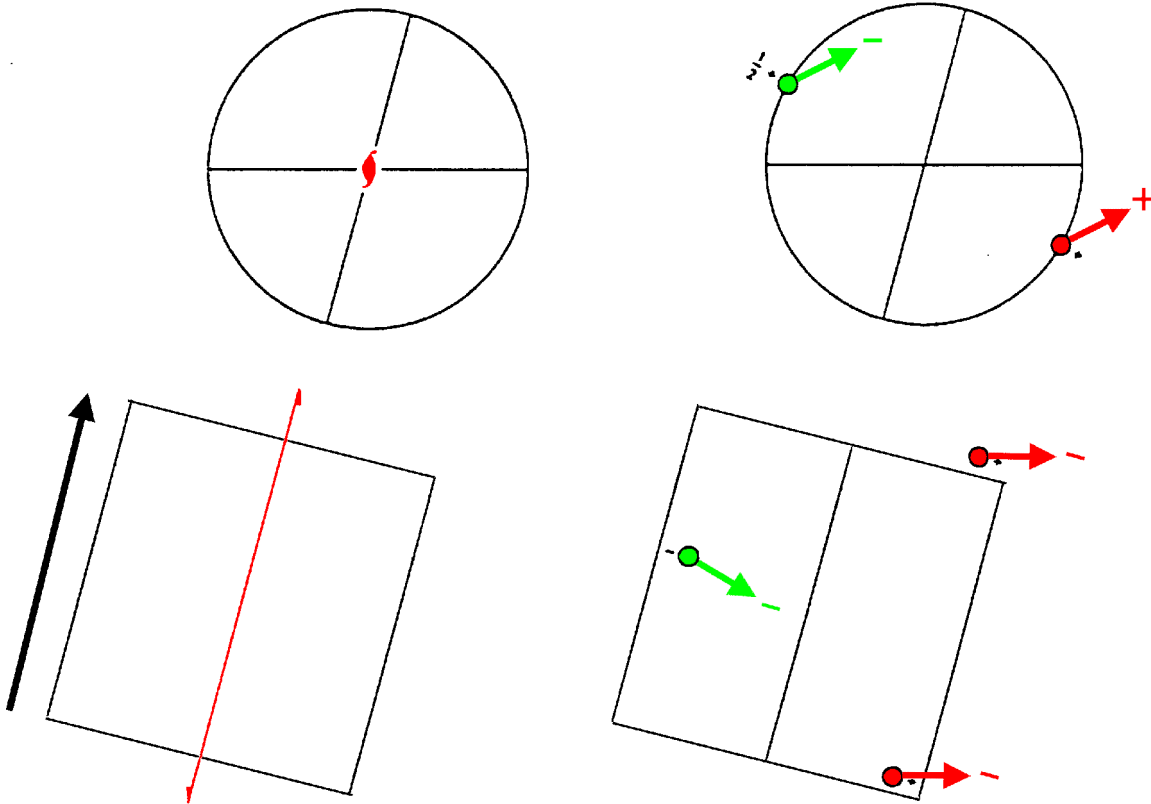
$p112_1'$

$2'$

Monoclinic/Rectangular

No. 9.3.39

$p112_1'$



Origin on $2_1'$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1$

Symmetry operations

- (1) 1
- (1|0,0,0)
- (2) $2' (0,0, \frac{1}{2})$ $0,0,z$
- ($2_z|0,0, \frac{1}{2}$)'

Generators selected (1); $t(0,0,1)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 a 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z+1/2 [u,v,\bar{w}]$

Symmetry of special projections

Along [001] $2'11$	Along [100] $p11g$ $a^* = c$	Along [010] $p11g$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

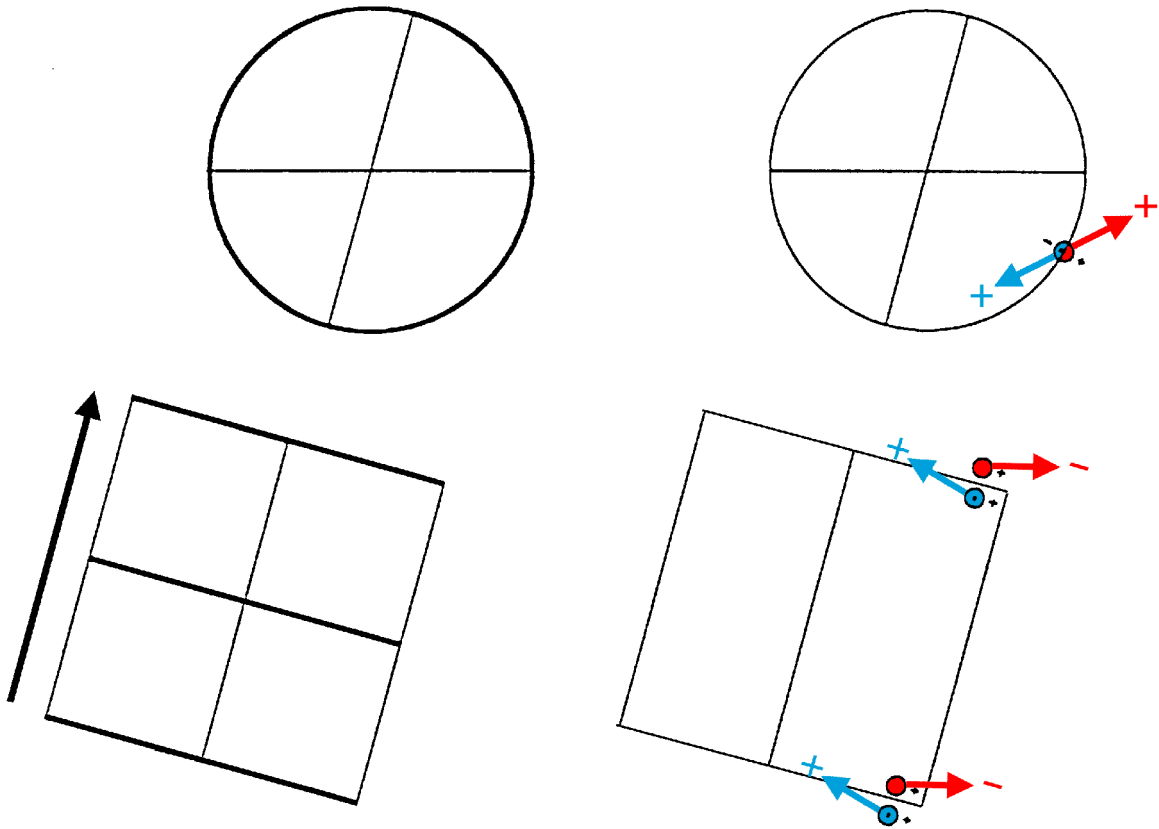
$p11m$

m

Monoclinic/Rectangular

No. 10.1.40

$p11m$



Origin on mirror plane m

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

(1) 1 (2) $m \quad x,y,0$
($1|0,0,0$) ($m_z|0,0,0$)

Generators selected (1); $t(0,0,1)$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
2 c 1	(1) x,y,z [u,v,w]	(2) x,y,\bar{z} [\bar{u},\bar{v},w]	
1 b m	$x,y,1/2$ [0,0,w]		
1 a m	$x,y,0$ [0,0,w]		

Symmetry of special projections

Along [001] $11'$	Along [100] $p1m1$	Along [010] $p1m1$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at 0,y,0

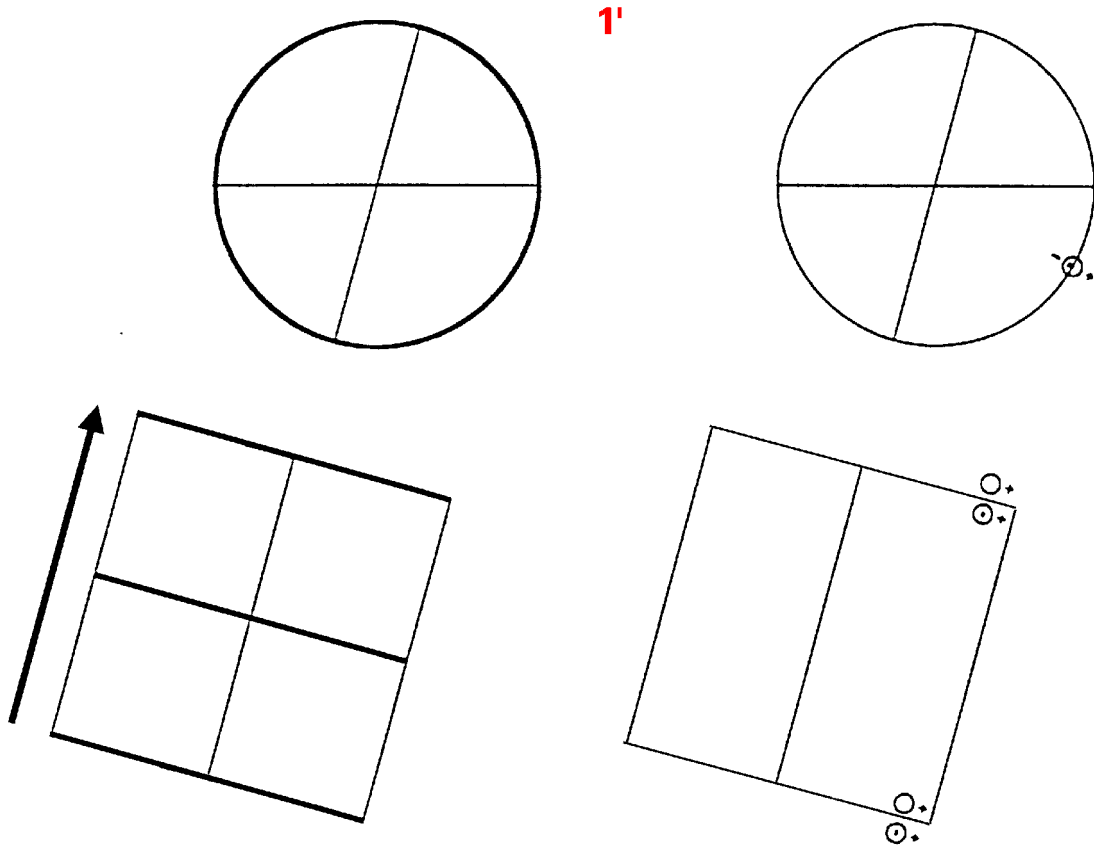
$p11m1'$

$m1'$

Monoclinic/Rectangular

No. 10.2.41

$p11m1'$



Origin on mirror plane $m1'$

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

For 1 + set

(1) 1	(2) $m \ x,y,0$
$(1 0,0,0)$	$(m_z 0,0,0)$

For $1'$ + set

(1) $1'$	(2) $m' \ x,y,0$
$(1 0,0,0)'$	$(m_z 0,0,0)'$

Continued

No. 10.2.41

$p11m1'$

Generators selected (1); $t(0,0,1)$; (2); $1'$

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		1+	1' +
2 c 11'	(1) x,y,z [0,0,0]	(2) x,y,\bar{z} [0,0,0]	
1 b $m1'$	$x,y,1/2$ [0,0,0]		
1 a $m1'$	$x,y,0$ [0,0,0]		

Symmetry of special projections

Along [001] $11'$	Along [100] $p1m11'$	Along [010] $p1m11'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

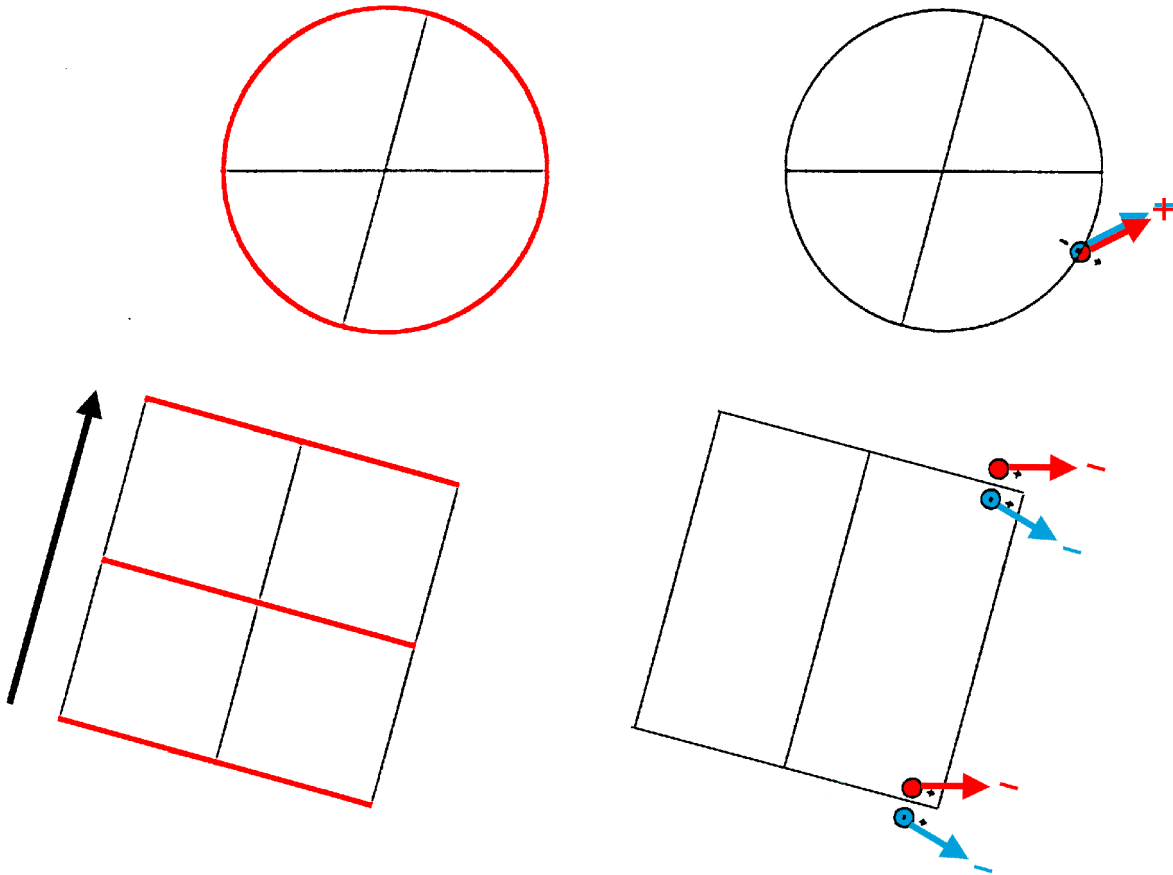
$p11m'$

No. 10.3.42

m'

$p11m'$

Monoclinic/Rectangular



Origin on mirror plane m'

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

(1) 1 (2) m' $x, y, 0$
(1|0,0,0) (m_z |0,0,0)

Generators selected (1); $t(0,0,1)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 c 1	(1) x,y,z [u,v,w]	(2) x,y,\bar{z} [u,v, \bar{w}]
1 b m'	$x,y,1/2$ [u,v,0]	
1 a m'	$x,y,0$ [u,v,0]	

Symmetry of special projections

Along [001] 1	Along [100] $p1m'1$ $a^* = c$	Along [010] $p1m'1$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

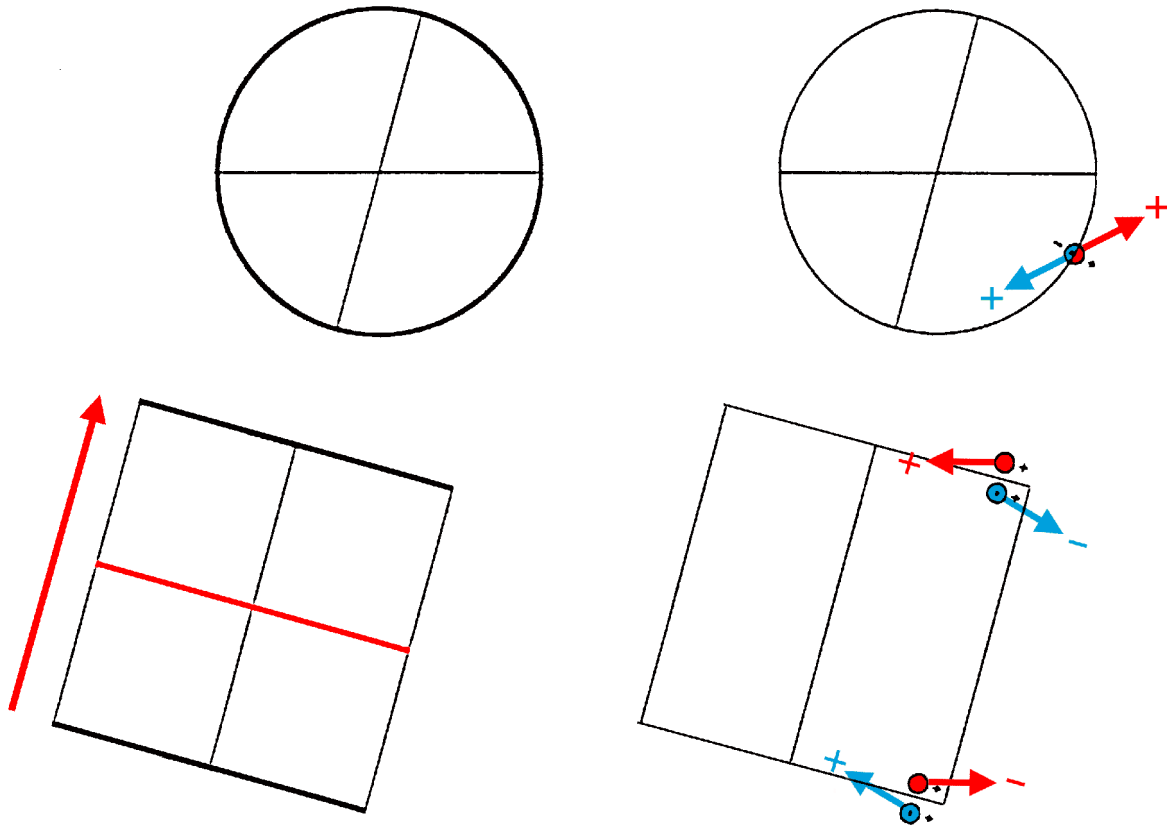
$p_{2c}11m$

$m1'$

Monoclinic/Rectangular

No. 10.4.43

$p_{2c}11m$



Origin on mirror plane m

Asymmetric unit $0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $m \ x,y,0$
$(1 0,0,0)$	$(m_z 0,0,0)$

For $(0,0,1)'$ + set

(1) $t' (0,0,1)$	(2) $m' \ x,y,1/2$
$(1 0,0,1)'$	$(m_z 0,0,1)'$

Generators selected (1); $t(0,0,1)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)' +
2	c 1	(1) x,y,z [u,v,w]	(2) x,y,\bar{z} [\bar{u},\bar{v},w]
1	b m'	$x,y,1/2$ [u,v,0]	
1	a m	$x,y,0$ [0,0,w]	

Symmetry of special projections

Along [001] $11'$	Along [100] $p_{2a^*}1m1$	Along [010] $p_{2a^*}1m1$
	$a^* = c$	$a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

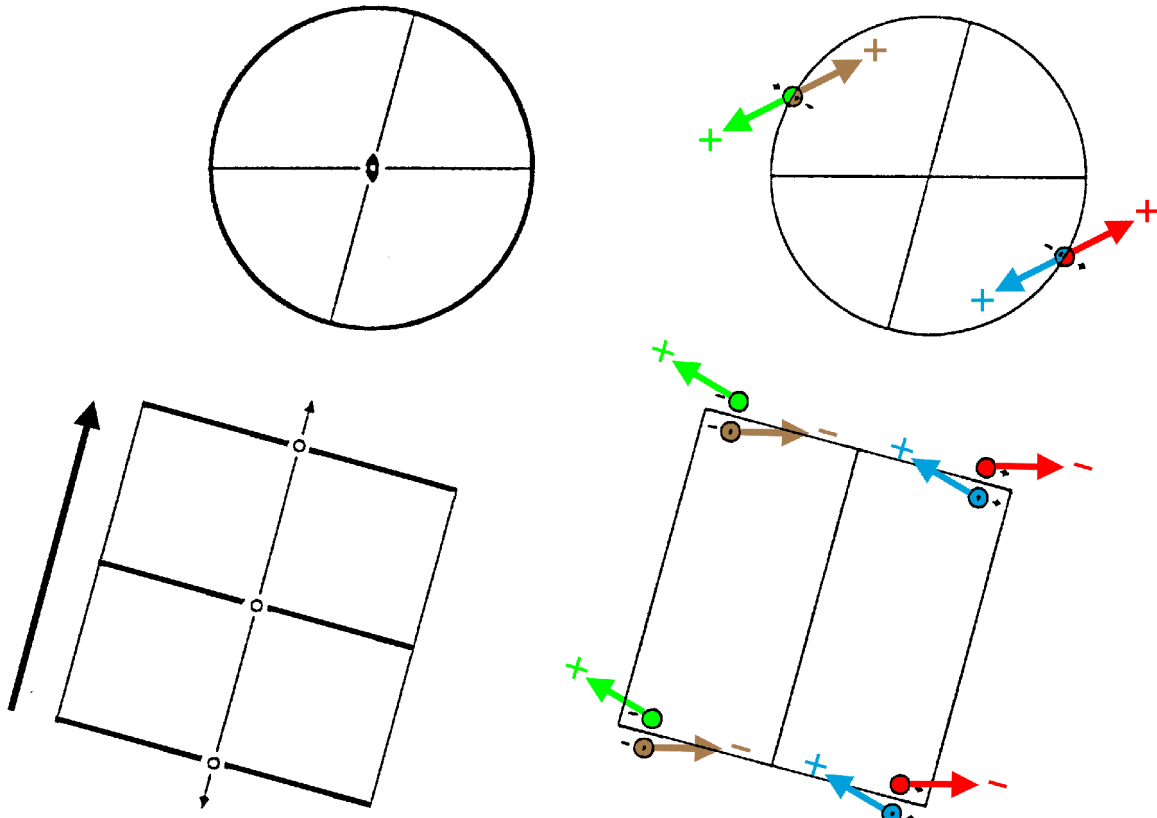
$p112/m$

$2/m$

Monoclinic/Rectangular

No. 11.1.44

$p112/m$



Origin at center $2/m$

Asymmetric unit $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1 (2) $2 \ 0,0,z$ (3) $\bar{1} \ 0,0,0$ (4) $m \ x,y,0$
(1|0,0,0) (2_z|0,0,0) ($\bar{1}$ |0,0,0) (m_z |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) x,y,\bar{z} [\bar{u},\bar{v},w]
2 e m	$x,y,1/2$ [0,0,w]	$\bar{x},\bar{y},1/2$ [0,0,w]
2 d m	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]
2 c 2	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]
1 b $2/m$	$0,0,1/2$ [0,0,w]	
1 a $2/m$	$0,0,0$ [0,0,w]	

Symmetry of special projections

Along [001] $2111'$	Along [100] $p2'mm'$	Along [010] $p2'mm'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at 0,y,0

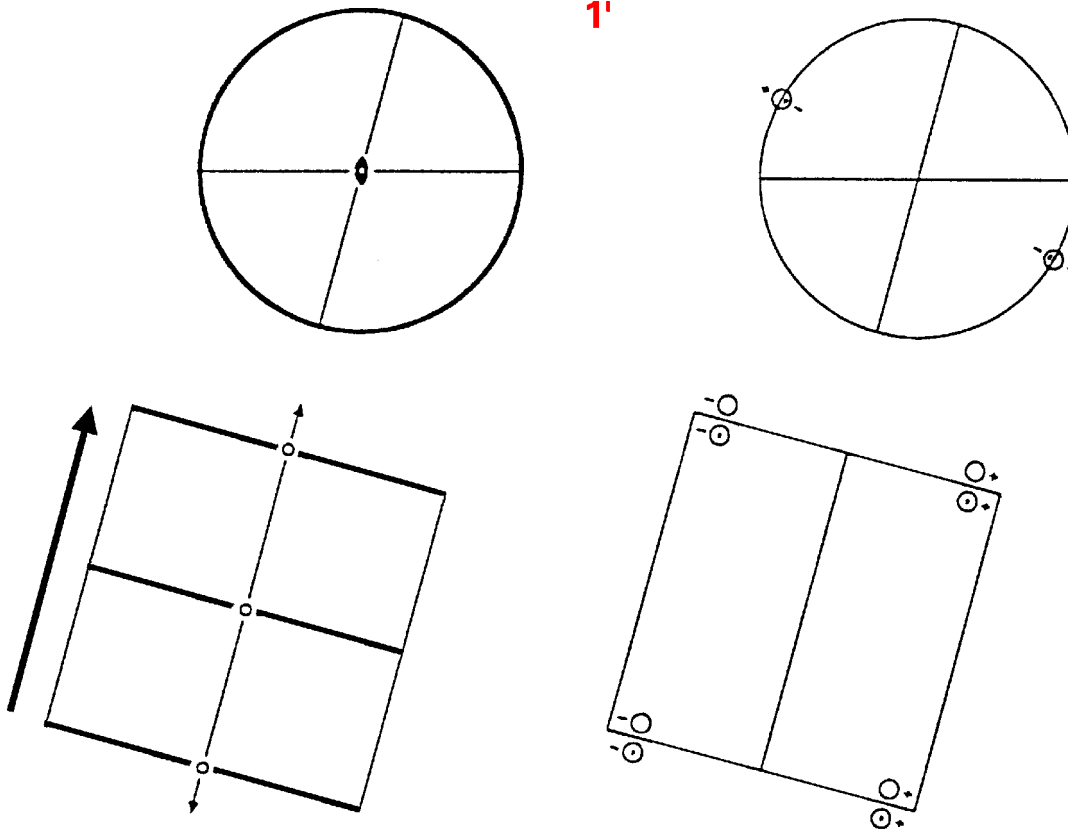
$p112/m1'$

$2/m1'$

Monoclinic/Rectangular

No. 11.2.45

$p112/m1'$



Origin at center $2/m1'$

Asymmetric unit $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For 1 + set

(1) 1	(2) $2 \quad 0,0,z$	(3) $\bar{1} \quad 0,0,0$	(4) $m \quad x,y,0$
$(1 0,0,0)$	$(2_z 0,0,0)$	$(\bar{1} 0,0,0)$	$(m_z 0,0,0)$

For 1' + set

(1) $1'$	(2) $2' \quad 0,0,z$	(3) $\bar{1}' \quad 0,0,0$	(4) $m' \quad x,y,0$
$(1 0,0,0)'$	$(2_z 0,0,0)'$	$(\bar{1}' 0,0,0)'$	$(m_z 0,0,0)'$

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1' +$
4 f $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(4) $x,y,\bar{z} [0,0,0]$
2 e $m1'$	$x,y,1/2 [0,0,0]$	$\bar{x},\bar{y},1/2 [0,0,0]$
2 d $m1'$	$x,y,0 [0,0,0]$	$\bar{x},\bar{y},0 [0,0,0]$
2 c $21'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$
1 b $2/m1'$	$0,0,1/2 [0,0,0]$	
1 a $2/m1'$	$0,0,0 [0,0,0]$	

Symmetry of special projections

Along [001] $2111'$	Along [100] $p2mm1'$	Along [010] $p2mm1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

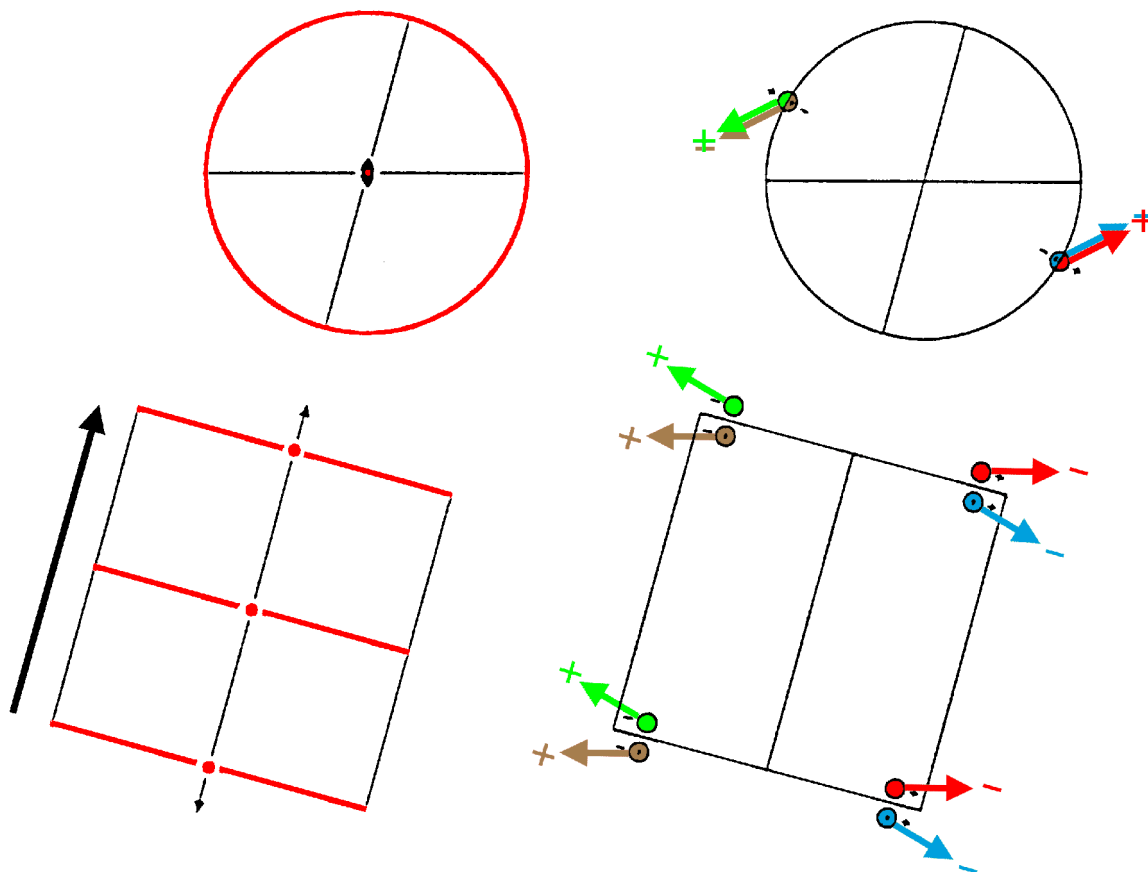
$p112/m'$

$2/m'$

Monoclinic/Rectangular

No. 11.3.46

$p112/m'$



Origin at center $2/m'$

Asymmetric unit $0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|-------------|-------------------|-------------------------|-----------------|
| (1) 1 | (2) $2_{z 0,0,z}$ | (3) $\bar{1}'_{ 0,0,0}$ | (4) $m'_x y,0$ |
| $(1 0,0,0)$ | $(2_z 0,0,0)$ | $(\bar{1}' 0,0,0)'$ | $(m'_z 0,0,0)'$ |

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 f 1	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) x,y,\bar{z} [u,v, \bar{w}]
2 e m'	$x,y,1/2$ [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]
2 d m'	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]
2 c 2	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]
1 b $2/m'$	$0,0,1/2$ [0,0,0]	
1 a $2/m'$	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] 211	Along [100] $p2m'm'$ $a^* = c$	Along [010] $p2m'm'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

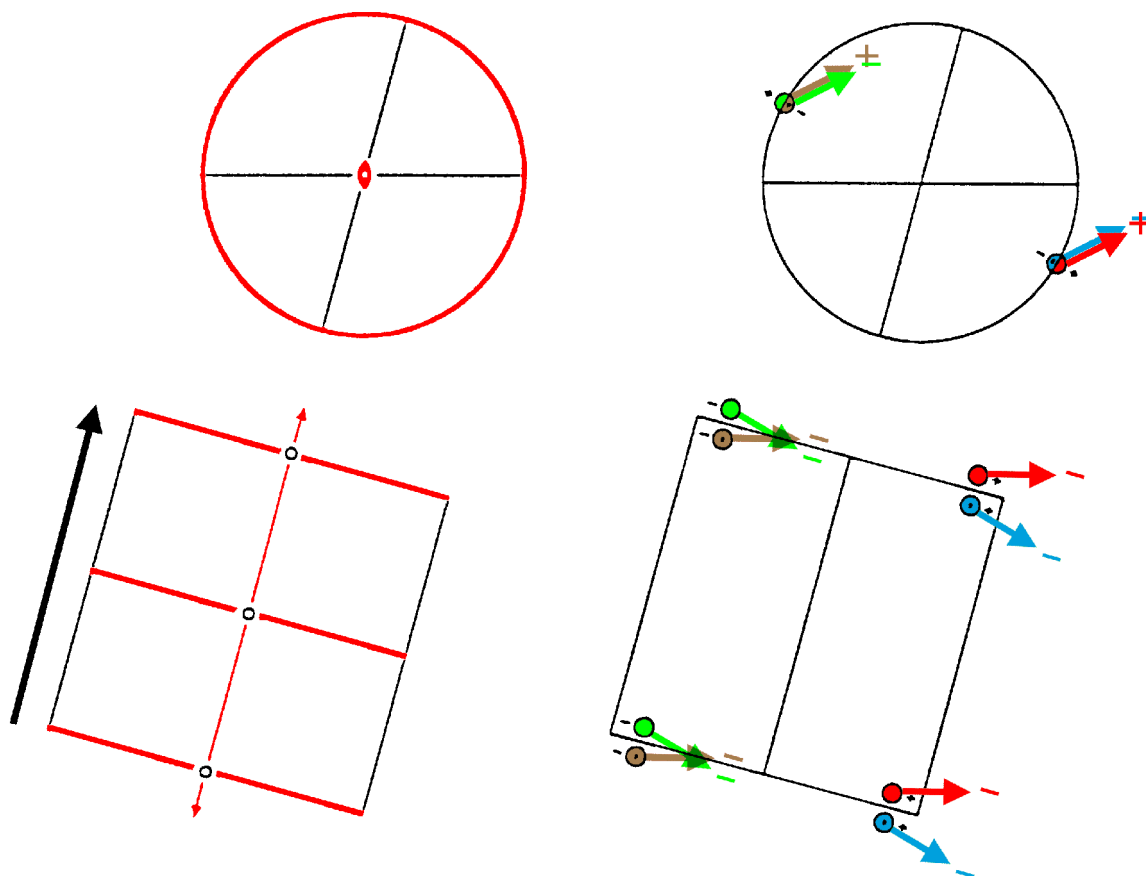
$p112'/m'$

No. 11.4.47

$2'/m'$

$p112'/m'$

Monoclinic/Rectangular



Origin at center $2'/m'$

Asymmetric unit $0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|-------------|------------------|-----------------------|------------------|
| (1) 1 | (2) $2' \ 0,0,z$ | (3) $\bar{1} \ 0,0,0$ | (4) $m' \ x,y,0$ |
| $(1 0,0,0)$ | $(2_z 0,0,0)'$ | $(\bar{1} 0,0,0)$ | $(m_z 0,0,0)'$ |

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]
4 f 1	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) x,y,\bar{z} [u,v, \bar{w}]
2 e m'	$x,y,1/2$ [u,v,0]	$\bar{x},\bar{y},1/2$ [u,v,0]
2 d m'	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [u,v,0]
2 c $2'$	$0,0,z$ [u,v,0]	$0,0,\bar{z}$ [u,v,0]
1 b $2'/m'$	$0,0,1/2$ [u,v,0]	
1 a $2'/m'$	$0,0,0$ [u,v,0]	

Symmetry of special projections

Along [001] $2'11$	Along [100] $p2'm'm$	Along [010] $p2'm'm$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at 0,y,0

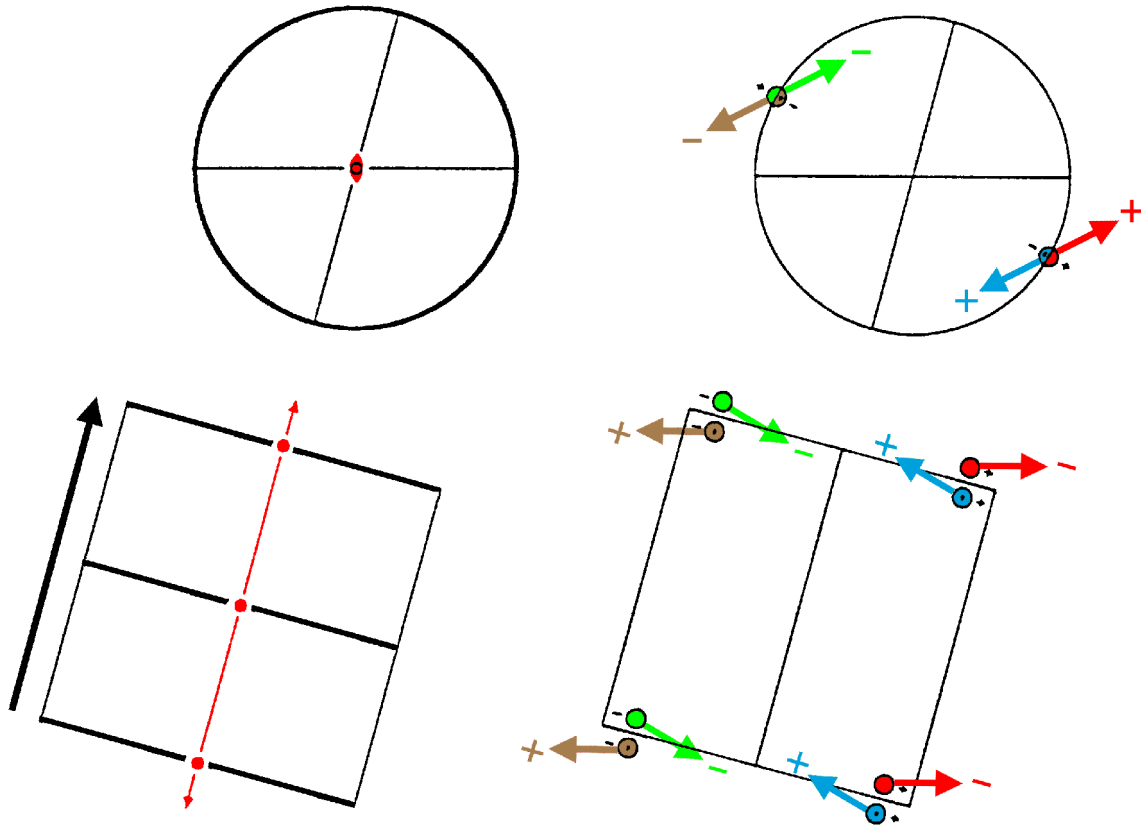
$p112'/m$

$2'/m$

Monoclinic/Rectangular

No. 11.5.48

$p112'/m$



Origin at center $2'/m$

Asymmetric unit $0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|-------------|----------------------|----------------------------|---------------------|
| (1) 1 | (2) $2' \quad 0,0,z$ | (3) $\bar{1}' \quad 0,0,0$ | (4) $m \quad x,y,0$ |
| $(1 0,0,0)$ | $(2_z 0,0,0)'$ | $(\bar{1} 0,0,0)'$ | $(m_z 0,0,0)$ |

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v,\bar{w}]
4 f 1	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) x,y,\bar{z} [\bar{u},\bar{v},w]
2 e m	$x,y,1/2$ [$0,0,w$]	$\bar{x},\bar{y},1/2$ [$0,0,\bar{w}$]
2 d m	$x,y,0$ [$0,0,w$]	$\bar{x},\bar{y},0$ [$0,0,\bar{w}$]
2 c 2'	$0,0,z$ [$u,v,0$]	$0,0,\bar{z}$ [$\bar{u},\bar{v},0$]
1 b 2'/m	$0,0,1/2$ [$0,0,0$]	
1 a 2'/m	$0,0,0$ [$0,0,0$]	

Symmetry of special projections

Along [001] 2111'	Along [100] $p2mm$ $a^* = c$	Along [010] $p2mm$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

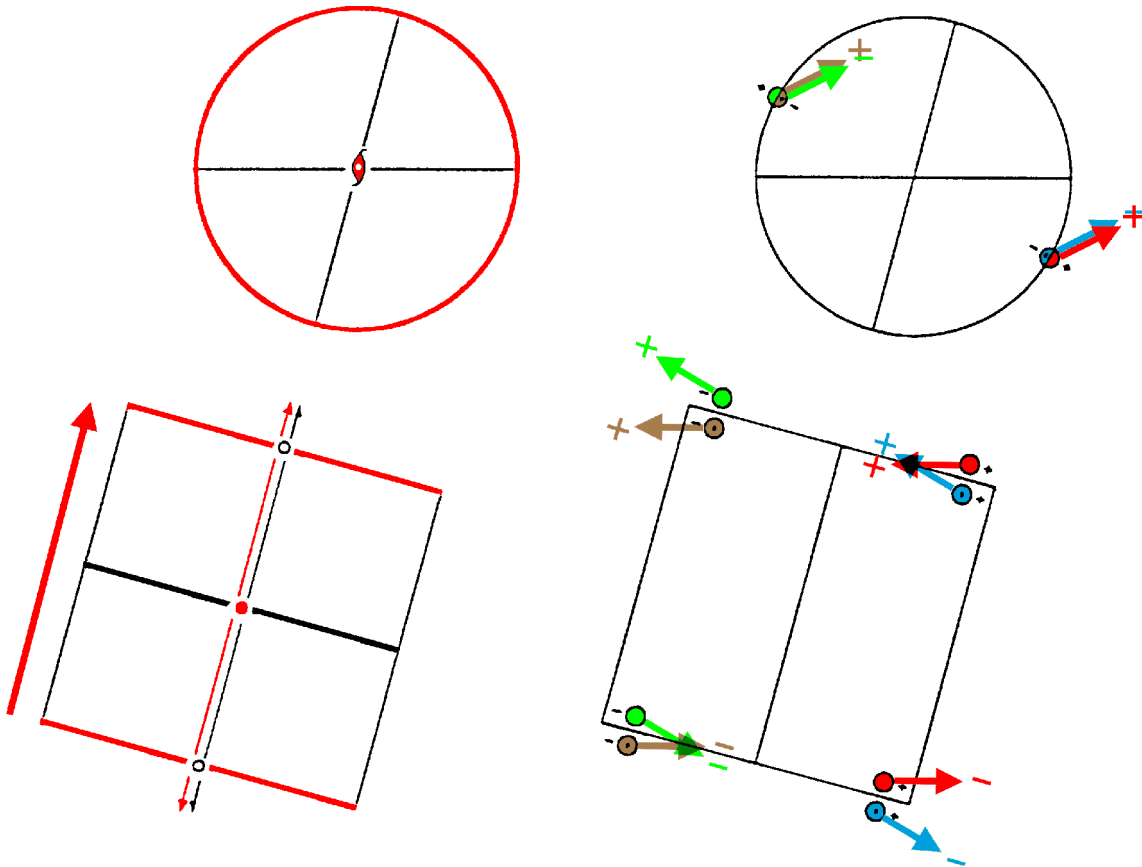
$p_{2c}112'/m'$

$2/m1'$

Monoclinic/Rectangular

No. 11.6.49

$p_{2c}112'/m'$



Origin at center $2'/m'$

Asymmetric unit $0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2' \ 0,0,z$	(3) $\bar{1} \ 0,0,0$	(4) $m' \ x,y,0$
$(1 0,0,0)$	$(2_z 0,0,0)'$	$(\bar{1} 0,0,0)$	$(m_z 0,0,0)'$

For $(0,0,1)'$ + set

(1) $t' \ (0,0,1)$	(2) $2 \ (0,0,1) \ 0,0,z$	(3) $\bar{1}' \ 0,0,1/2$	(4) $m \ x,y,1/2$
$(1 0,0,1)'$	$(2_z 0,0,1)$	$(\bar{1}' 0,0,1)'$	$(m_z 0,0,1)$

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		$(0,0,0)+$ $(0,0,1)'+$
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $x,y,\bar{z} [u,v,\bar{w}]$
2 e m	$x,y,1/2 [0,0,w]$	$\bar{x},\bar{y},1/2 [0,0,\bar{w}]$
2 d m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [u,v,0]$
2 c 2'	$0,0,z [u,v,0]$	$0,0,\bar{z} [u,v,0]$
1 b 2'/m	$0,0,1/2 [0,0,0]$	
1 a 2'/m'	$0,0,0 [u,v,0]$	

Symmetry of special projections

Along [001] $2111'$	Along [100] $p_{2a^*}2mm$	Along [010] $p_{2a^*}2mm$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,1/4$	$a^* = c$ Origin at $0,y,1/4$

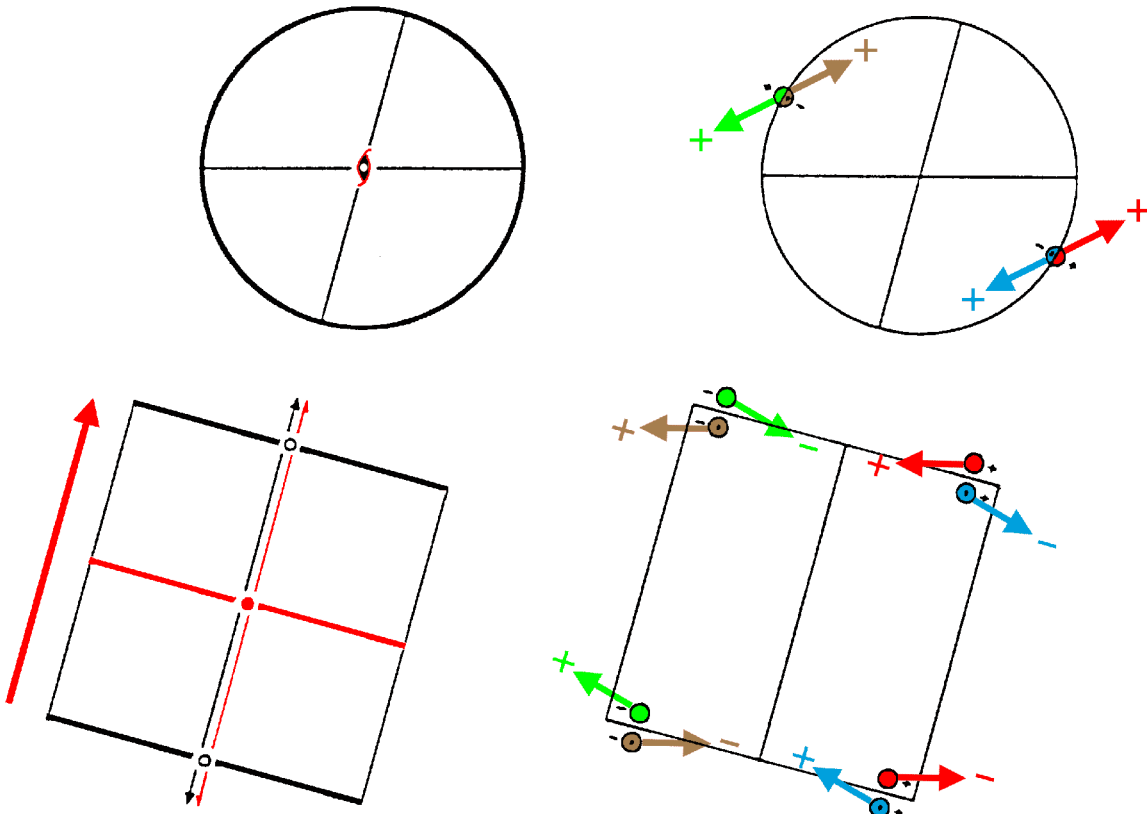
$p_{2c}112/m$

$2/m1'$

Monoclinic/Rectangular

No. 11.7.50

$p_{2c}112/m$



Origin at center $2/m$

Asymmetric unit $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2_{0,0,z}$	(3) $\bar{1}_{0,0,0}$	(4) $m_{x,y,0}$
$(1 0,0,0)$	$(2_z 0,0,0)$	$(\bar{1} 0,0,0)$	$(m_z 0,0,0)$

For $(0,0,1)'$ + set

(1) $t'(0,0,1)$	(2) $2'(0,0,1)$	$0,0,z$	(3) $\bar{1}'_{0,0,1/2}$	(4) $m'_{x,y,1/2}$
$(1 0,0,1)'$	$(2'_z 0,0,1)'$		$(\bar{1}' 0,0,1)'$	$(m'_z 0,0,1)'$

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		$(0,0,0)+$ $(0,0,1)'+$
4 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) x,y,\bar{z} [\bar{u},\bar{v},w]
2 e m'	$x,y,1/2$ [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]
2 d m	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]
2 c 2	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]
1 b $2/m'$	$0,0,1/2$ [0,0,0]	
1 a $2/m$	$0,0,0$ [0,0,w]	

Symmetry of special projections

Along [001] $2111'$	Along [100] $p_{2a^*}2m'm'$	Along [010] $p_{2a^*}2m'm'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,1/4$	$a^* = c$ Origin at $0,y,1/4$

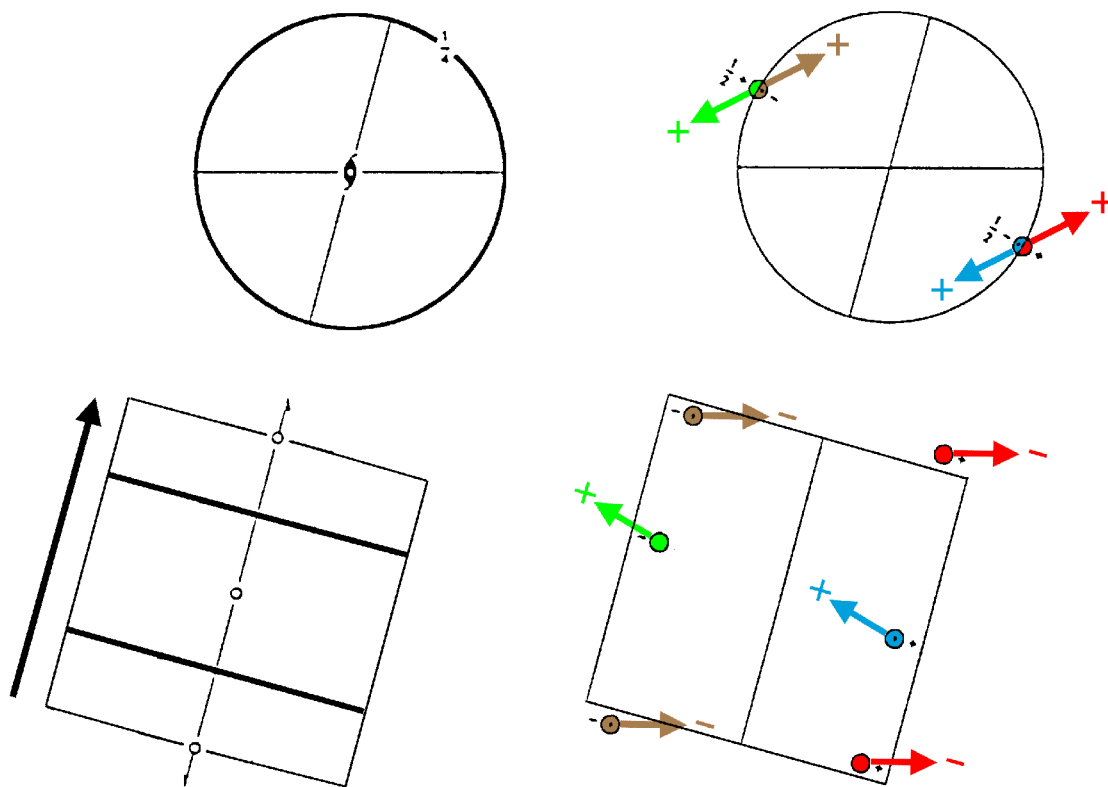
$p112_1/m$

$2/m$

Monoclinic/Rectangular

No. 12.1.51

$p112_1/m$



Origin at $\bar{1}$ on 2_1

Asymmetric unit $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--------------------|---|--|--|
| (1) 1
(1 0,0,0) | (2) $2(0,0,1/2)$ $0,0,z$
(2_z 0,0, $1/2$) | (3) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (4) m $x,y,1/4$
(m_z 0,0, $1/2$) |
|--------------------|---|--|--|

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z+1/2 [\bar{u},\bar{v},w]$ (3) $\bar{x},\bar{y},\bar{z} [u,v,w]$ (4) $x,y,\bar{z}+1/2 [\bar{u},\bar{v},w]$
2 b m	$x,y,1/4 [0,0,w]$	$\bar{x},\bar{y},3/4 [0,0,w]$
2 a $\bar{1}$	$0,0,0 [u,v,w]$	$0,0,1/2 [\bar{u},\bar{v},w]$

Symmetry of special projections

Along [001] $2111'$	Along [100] $p2'mg'$	Along [010] $p2'mg'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

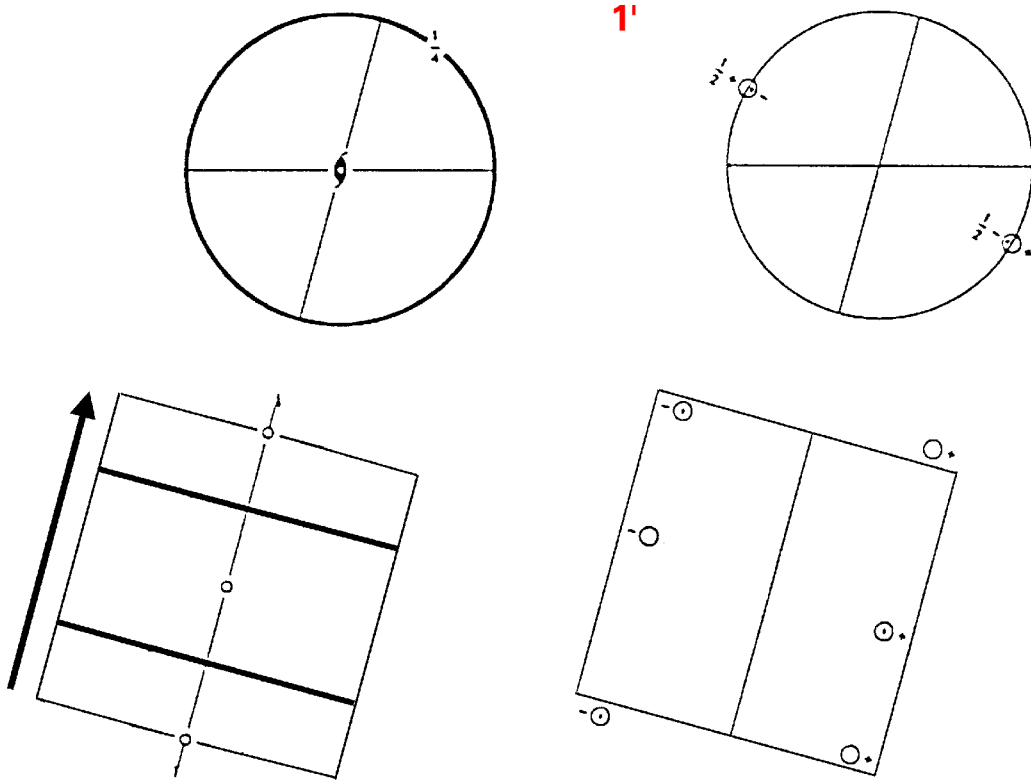
$p112_1/m1'$

$2/m1'$

Monoclinic/Rectangular

No. 12.2.52

$p112_1/m1'$



Origin at $\bar{1}1'$ on $2_11'$

Asymmetric unit $0 \leq z \leq 1/4$

Symmetry operations

For $1 + \text{set}$

(1) 1	(2) $2(0,0,1/2)$	$0,0,z$	(3) $\bar{1}$	$0,0,0$	(4) m	$x,y,1/4$
$(1 0,0,0)$	$(2_z 0,0,1/2)$		$(\bar{1} 0,0,0)$		$(m_z 0,0,1/2)$	

For $1' + \text{set}$

(1) $1'$	(2) $2(0,0,1/2)'$	$0,0,z$	(3) $\bar{1}'$	$0,0,0$	(4) m'	$x,y,1/4$
$(1 0,0,0)'$	$(2_z 0,0,1/2)'$		$(\bar{1}' 0,0,0)'$		$(m_z 0,0,1/2)'$	

Continued

No. 12.2.52

$p112_1/m1'$

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry			$1+$	$1'+$	
4	c $11'$	(1) x,y,z [0,0,0]	(2) $\bar{x},\bar{y},z+1/2$ [0,0,0]	(3) \bar{x},\bar{y},\bar{z} [0,0,0]	(4) $x,y,\bar{z}+1/2$ [0,0,0]
2	b $m1'$	$x,y,1/4$ [0,0,0]		$\bar{x},\bar{y},3/4$ [0,0,0]	
2	a $\bar{1}1'$	$0,0,0$ [0,0,0]		$0,0,1/2$ [0,0,0]	

Symmetry of special projections

Along [001] $2111'$	Along [100] $p2mg1'$	Along [010] $p2mg1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

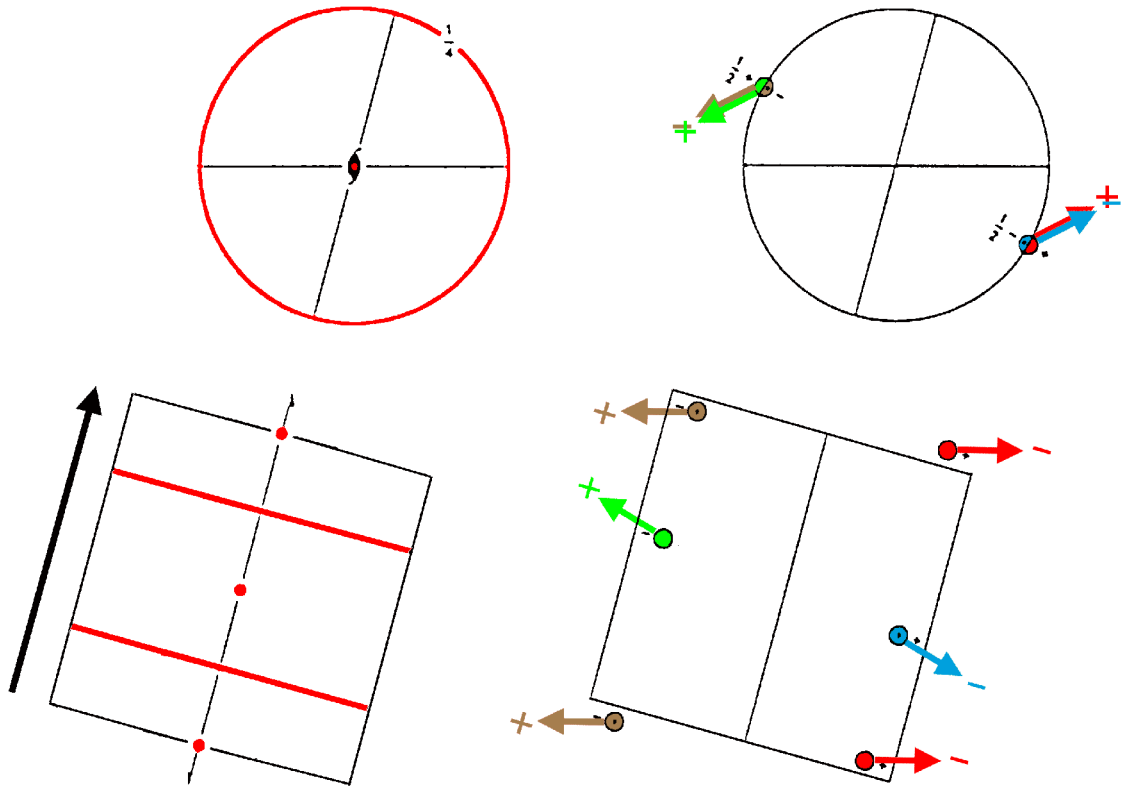
$p112_1/m'$

$2/m'$

Monoclinic/Rectangular

No. 12.3.53

$p112_1/m'$



Origin at $\bar{1}$ on 2_1

Asymmetric unit $0 \leq z \leq 1/4$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2(0,0,1/2)$ $0,0,z$
(2_z | $0,0,1/2$)

(3) $\bar{1}$ $0,0,0$
($\bar{1}$ | $0,0,0$)'

(4) m' $x,y,1/4$
(m_z | $0,0,1/2$)'

Continued

No. 12.3.53

$p112_1/m'$

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
4 c 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) $x,y,\bar{z}+1/2$ [u,v, \bar{w}]
2 b m'	$x,y,1/4$ [u,v,0]	$\bar{x},\bar{y},3/4$ [$\bar{u},\bar{v},0$]		
2 a $\bar{1}'$	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]		

Symmetry of special projections

Along [001] 211	Along [100] $p2m'g'$	Along [010] $p2m'g'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at 0,y,0

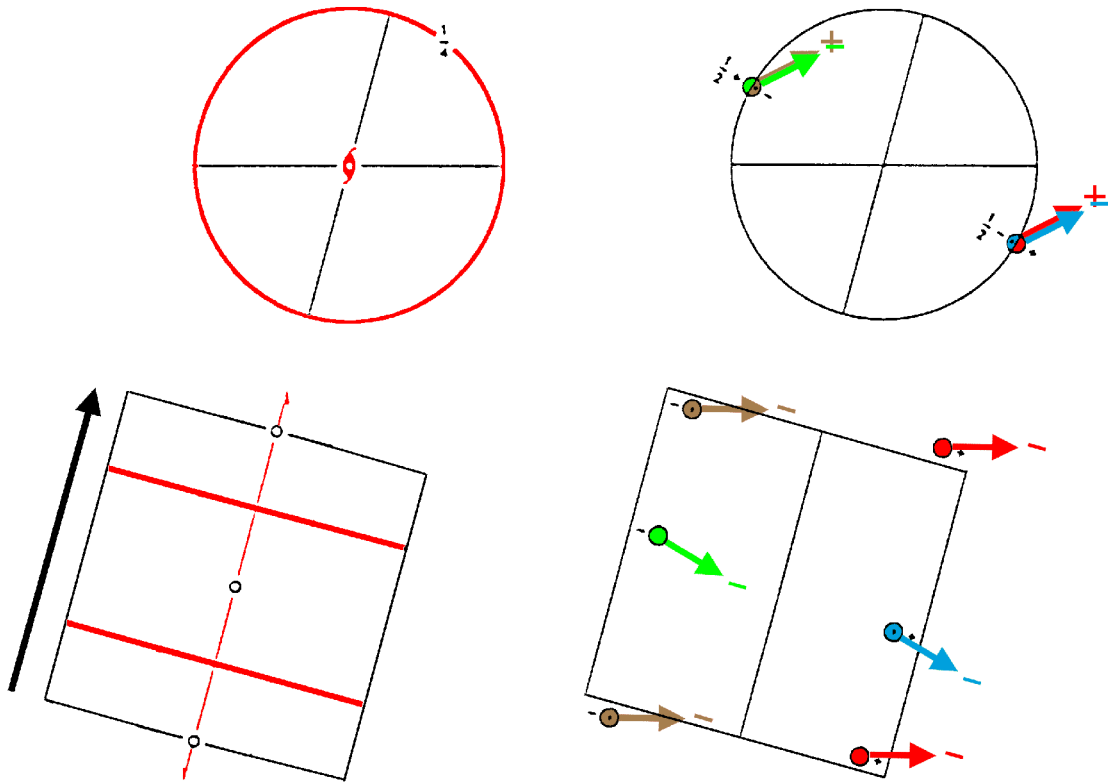
$p112_1/m'$

$2'/m'$

Monoclinic/Rectangular

No. 12.4.54

$p112_1/m'$



Origin at $\bar{1}$ on $2_1'$

Asymmetric unit $0 \leq z \leq 1/4$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'(0,0,1/2)$ $0,0,z$
(2_z |0,0, $1/2$)'

(3) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(4) m' x,y,1/4
(m_z |0,0, $1/2$)'

Continued

No. 12.4.54

$p112_1/m'$

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
4 c 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) $x,y,\bar{z}+1/2$ [u,v, \bar{w}]
2 b m'	$x,y,1/4$ [u,v,0]	$\bar{x},\bar{y},3/4$ [u,v,0]		
2 a $\bar{1}$	$0,0,0$ [u,v,w]	$0,0,1/2$ [u,v, \bar{w}]		

Symmetry of special projections

Along [001] $2'11$	Along [100] $p2'm'g$	Along [010] $p2'm'g$
	$a^* = c$	$a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

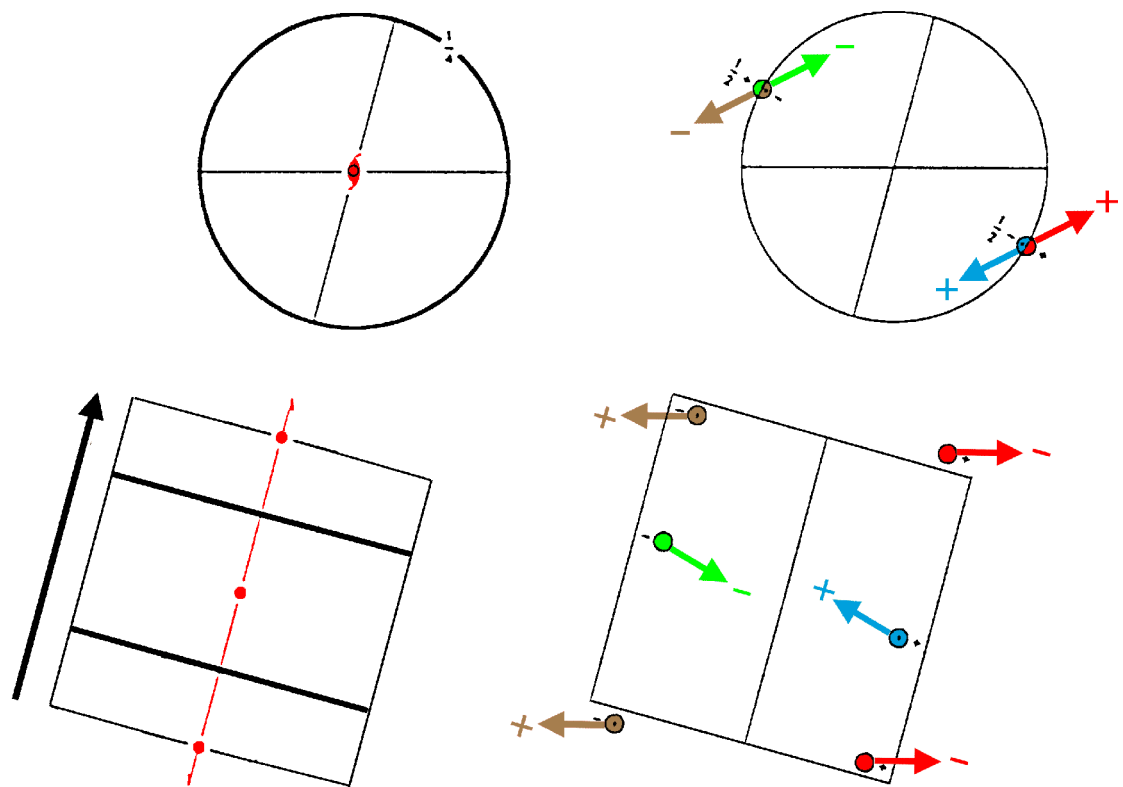
$p112_1/m$

$2'/m$

Monoclinic/Rectangular

No. 12.5.55

$p112_1/m$



Origin at $\bar{1}$ on $2_1'$

Asymmetric unit $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--------------------|---|---|--|
| (1) 1
(1 0,0,0) | (2) $2'(0,0,1/2)$ $0,0,z$
(2_z 0,0, $1/2$)' | (3) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (4) m $x,y,1/4$
(m_z 0,0, $1/2$) |
|--------------------|---|---|--|

Continued

No. 12.5.55

$p112_1/m$

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
4 c 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) $x,y,\bar{z}+1/2$ [\bar{u},\bar{v},w]
2 b m	$x,y,1/4$ [0,0,w]	$\bar{x},\bar{y},3/4$ [0,0, \bar{w}]		
2 a $\bar{1}$ '	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]		

Symmetry of special projections

Along [001] $2111'$	Along [100] $p2mg$	Along [010] $p2mg$
	$a^* = c$	$a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

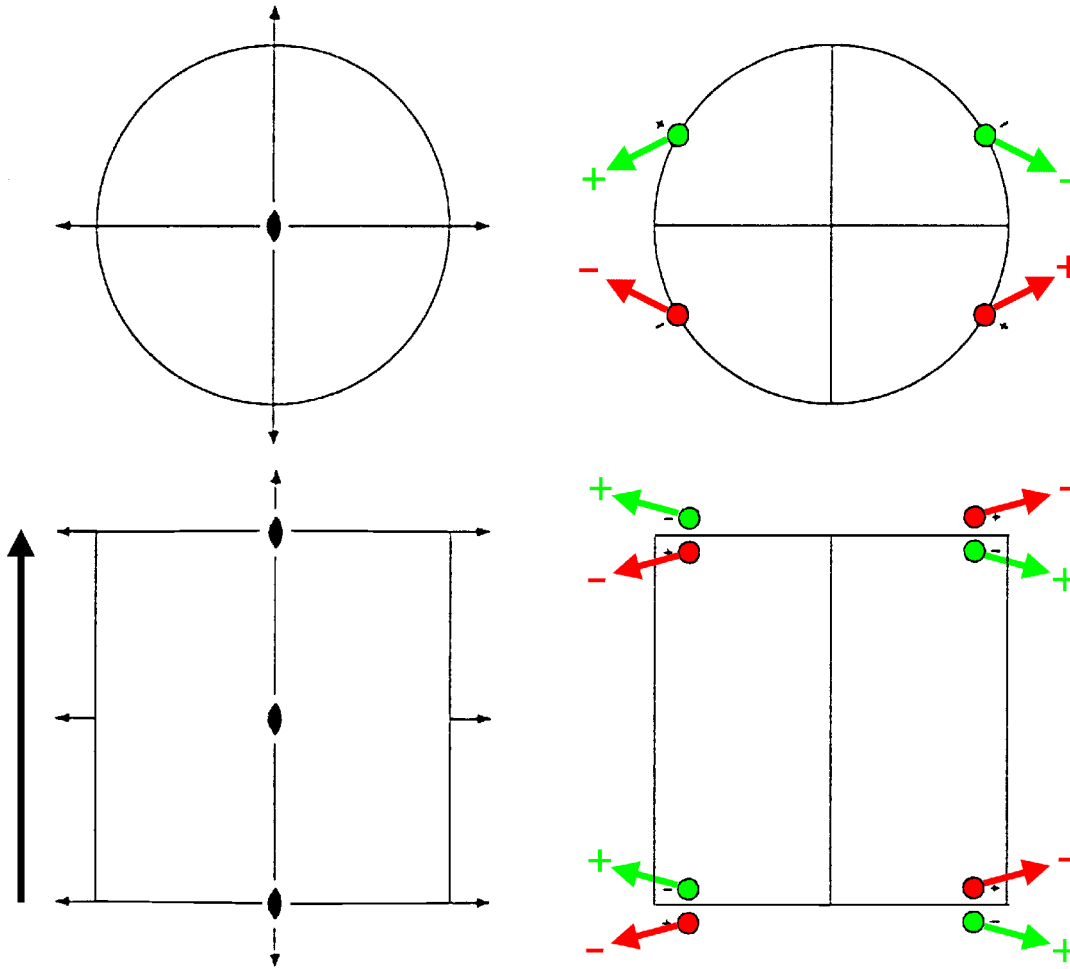
*p*222

222

Orthorhombic

No. 13.1.56

*p*222



Origin at 222

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- | | | | |
|---------------|-----------------------------|-----------------------------|-----------------------------|
| (1) 1 | (2) 2 $0,0,z$ | (3) 2 $0,y,0$ | (4) 2 $x,0,0$ |
| (1 $0,0,0$) | (2 _z $0,0,0$) | (2 _y $0,0,0$) | (2 _x $0,0,0$) |

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u, v, w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]
4 h 1	(3) \bar{x}, y, \bar{z} [\bar{u}, v, \bar{w}]	(4) x, \bar{y}, \bar{z} [u, \bar{v}, \bar{w}]
2 g ..2	0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]
2 f .2.	0,y,1/2 [0,v,0]	0, \bar{y} ,1/2 [0, \bar{v} ,0]
2 e .2.	0,y,0 [0,v,0]	0, \bar{y} ,0 [0, \bar{v} ,0]
2 d 2..	x,0,1/2 [u,0,0]	\bar{x} ,0,1/2 [\bar{u} ,0,0]
2 c 2..	x,0,0 [u,0,0]	\bar{x} ,0,0 [\bar{u} ,0,0]
1 b 222	0,0,1/2 [0,0,0]	
1 a 222	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] $2m'm'$	Along [100] $p2m'm'$	Along [010] $p2m'm'$
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}$ Origin at 0,y,0

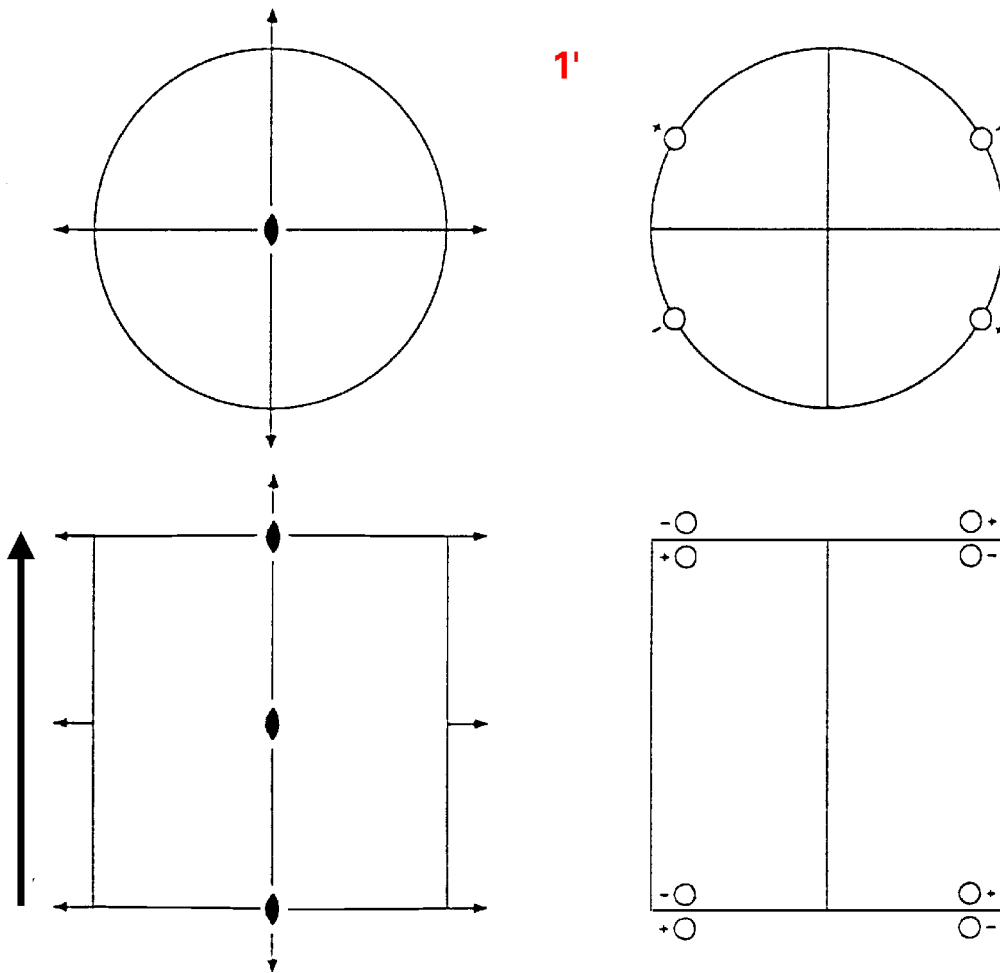
$p2221'$

No. 13.2.57

$2221'$

$p2221'$

Orthorhombic



Origin at $2221'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For 1 + set

(1) 1	(2) 2 $0,0,z$	(3) 2 $0,y,0$	(4) 2 $x,0,0$
(1 $0,0,0$)	(2 _z $0,0,0$)	(2 _y $0,0,0$)	(2 _x $0,0,0$)

For 1' + set

(1) 1'	(2) 2' $0,0,z$	(3) 2' $0,y,0$	(4) 2' $x,0,0$
(1 $0,0,0$)'	(2 _z $0,0,0$)'	(2 _y $0,0,0$)'	(2 _x $0,0,0$)'

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1' +$
4 h $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $\bar{x},y,\bar{z} [0,0,0]$	(4) $x,\bar{y},\bar{z} [0,0,0]$
2 g $..21'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$
2 f $.2.1'$	$0,y,1/2 [0,0,0]$	$0,\bar{y},1/2 [0,0,0]$
2 e $.2.1'$	$0,y,0 [0,0,0]$	$0,\bar{y},0 [0,0,0]$
2 d $2..1'$	$x,0,1/2 [0,0,0]$	$\bar{x},0,1/2 [0,0,0]$
2 c $2..1'$	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$
1 b $2221'$	$0,0,1/2 [0,0,0]$	
1 a $2221'$	$0,0,0 [0,0,0]$	

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p2mm1'$	Along [010] $p2mm1'$
Origin at $0,0,z$	$\mathbf{a}^* = \mathbf{c}$ Origin at $x,0,0$	$\mathbf{a}^* = \mathbf{c}$ Origin at $0,y,0$

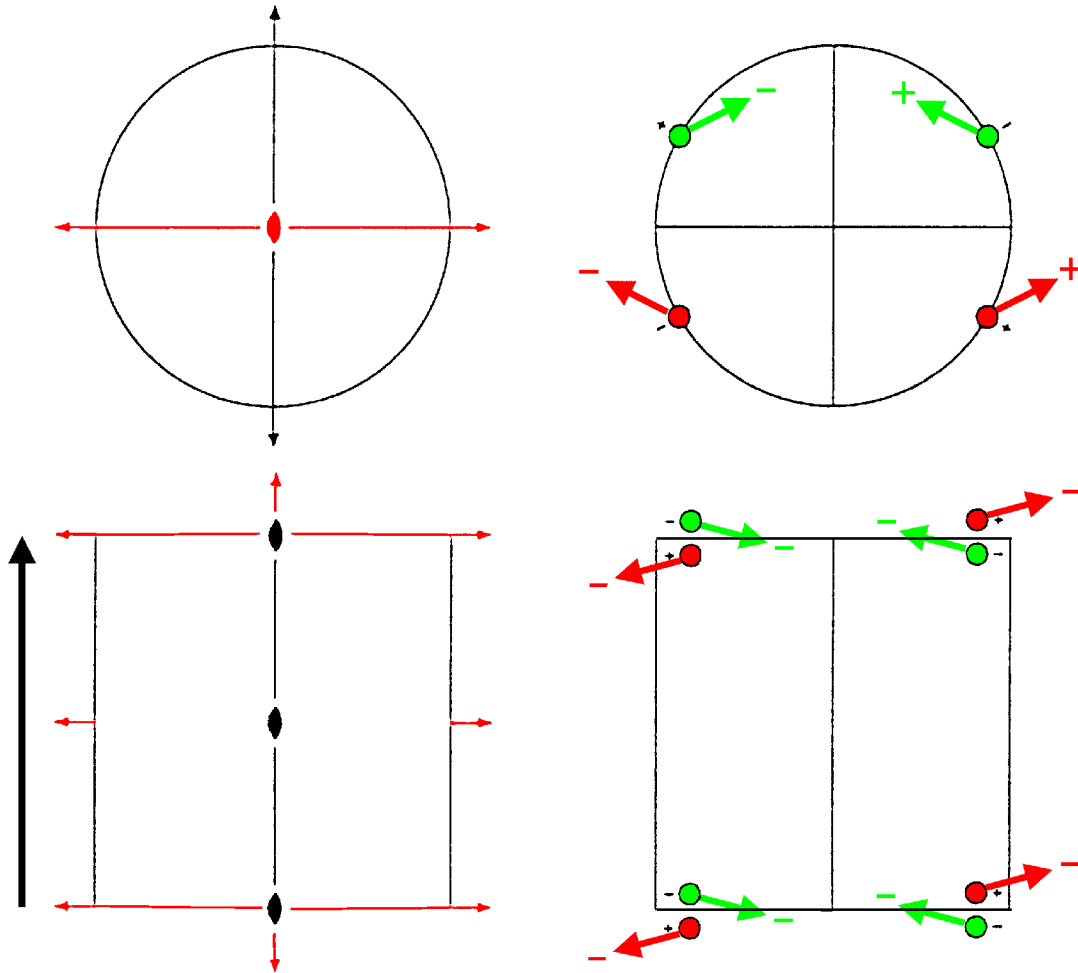
$p22'2'$

No. 13.3.58

$22'2'$

$p22'2'$

Orthorhombic



Origin at $22'2'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- | | | | |
|--------------------|--------------------------------------|--------------------------------------|-------------------------------------|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,0,z
(2_z 0,0,0)' | (3) $2'_y$ 0,y,0
(2_y 0,0,0)' | (4) $2'_x$ x,0,0
(2_x 0,0,0) |
|--------------------|--------------------------------------|--------------------------------------|-------------------------------------|

Generators selected (1); t(0,0,1); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [u,v, \bar{w}]
4 h 1	(3) \bar{x}, y, \bar{z} [u, \bar{v} ,w]	(4) x, \bar{y}, \bar{z} [u, \bar{v} , \bar{w}]
2 g ..2'	0,0,z [u,v,0]	0,0, \bar{z} [u, \bar{v} ,0]
2 f .2'	0,y,1/2 [u,0,w]	0, \bar{y} ,1/2 [u,0, \bar{w}]
2 e .2'	0,y,0 [u,0,w]	0, \bar{y} ,0 [u,0, \bar{w}]
2 d 2..	x,0,1/2 [u,0,0]	\bar{x} ,0,1/2 [u,0,0]
2 c 2..	x,0,0 [u,0,0]	\bar{x} ,0,0 [u,0,0]
1 b 22'2'	0,0,1/2 [u,0,0]	
1 a 22'2'	0,0,0 [u,0,0]	

Symmetry of special projections

Along [001] 2'mm'	Along [100] p2mm	Along [010] p2'm'm
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}$ Origin at 0,y,0

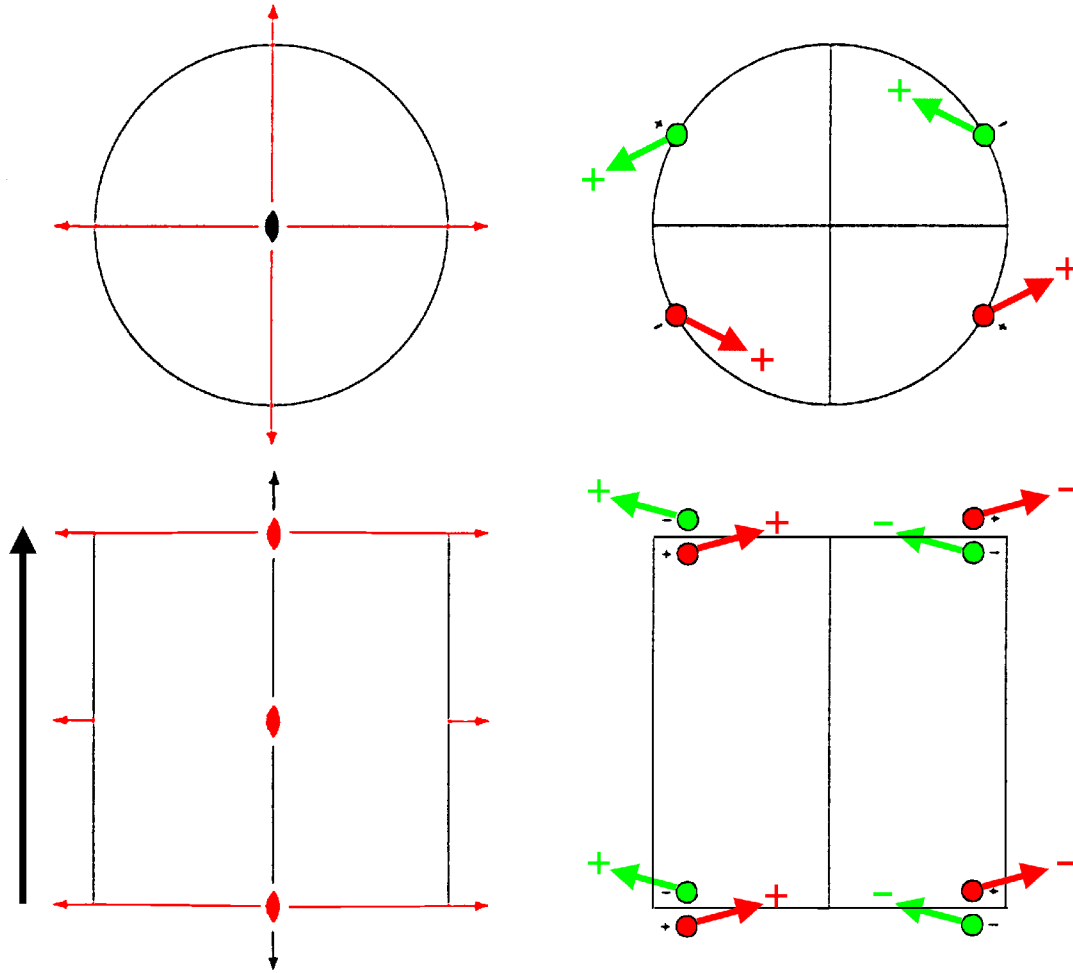
$p2'2'2$

No. 13.4.59

$2'2'2$

$p2'2'2$

Orthorhombic



Origin at $2'2'2$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2_{0,0,z}$
(2_z |0,0,0)

(3) $2'_{0,y,0}$
(2_y |0,0,0)'

(4) $2'_x,0,0$
(2_x |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 h 1	(3) \bar{x},y,\bar{z} [u,\bar{v},w]	(4) x,\bar{y},\bar{z} [\bar{u},v,w]
2 g ..2	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]
2 f .2'	0,y,1/2 [u,0,w]	0, \bar{y} ,1/2 [\bar{u} ,0,w]
2 e .2'	0,y,0 [u,0,w]	0, \bar{y} ,0 [\bar{u} ,0,w]
2 d 2'..	x,0,1/2 [0,v,w]	\bar{x} ,0,1/2 [0, \bar{v} ,w]
2 c 2'..	x,0,0 [0,v,w]	\bar{x} ,0,0 [0, \bar{v} ,w]
1 b 2'2'2	0,0,1/2 [0,0,w]	
1 a 2'2'2	0,0,0 [0,0,w]	

Symmetry of special projections

Along [001] 2mm	Along [100] $p2'mm'$ $\mathbf{a}^* = \mathbf{c}$	Along [010] $p2'mm'$ $\mathbf{a}^* = \mathbf{c}$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

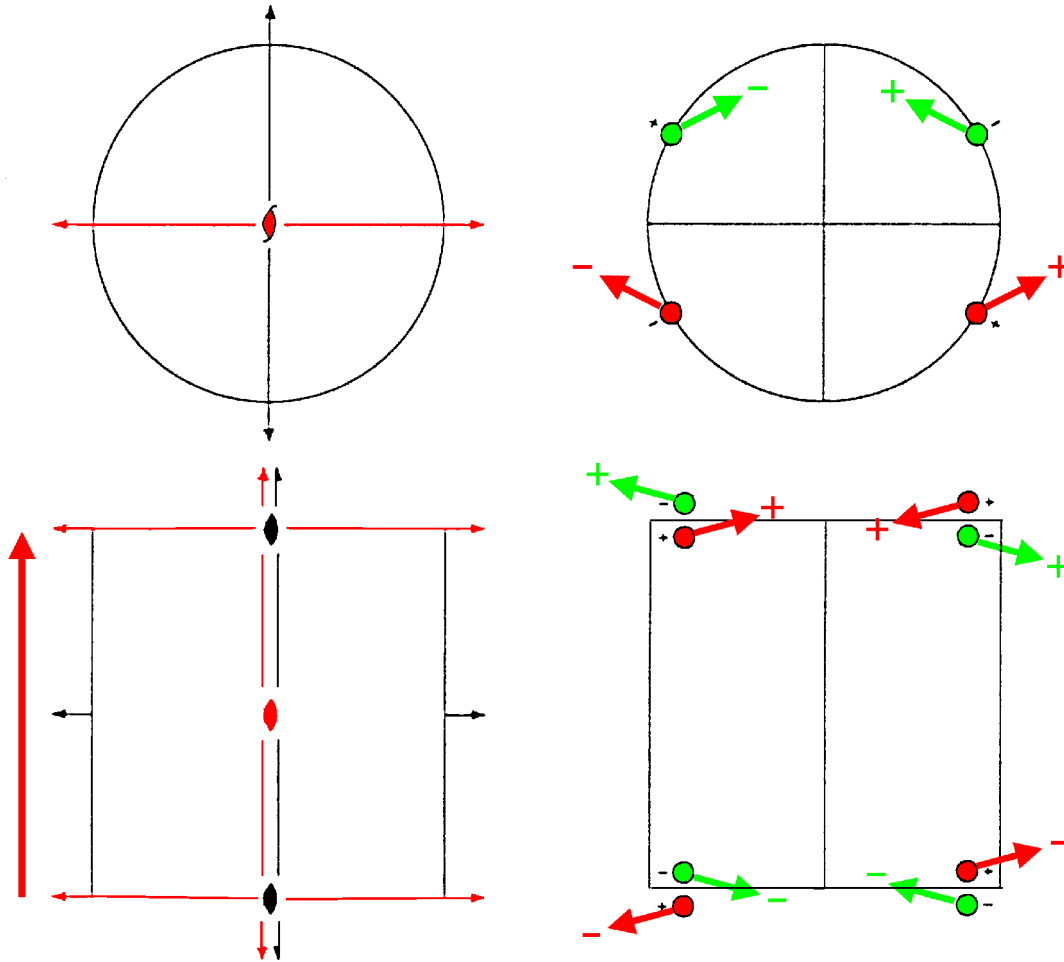
$p_{2c}22'2'$

2221'

Orthorhombic

No. 13.5.60

$p_{2c}22'2'$



Origin at $22'2'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2'_z \ 0,0,z$	(3) $2'_y \ 0,y,0$	(4) $2'_x \ x,0,0$
(1 $0,0,0$)	(2_z $0,0,0$)'	(2_y $0,0,0$)'	(2_x $0,0,0$)

For $(0,0,1)'$ + set

(1) $t' \ (0,0,1)$	(2) $2 \ (0,0,1) \ 0,0,z$	(3) $2 \ 0,y,1/2$	(4) $2'_x \ x,0,1/2$
(1 $0,0,1$)'	(2_z $0,0,1$)	(2_y $0,0,1$)	(2_x $0,0,1$)'

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		$(0,0,0)_+$ $(0,0,1)'$ +
4 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$
	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
2 g ..2'	$0,0,z [u,v,0]$	$0,0,\bar{z} [u,\bar{v},0]$
2 f .2.	$0,y,1/2 [0,v,0]$	$0,\bar{y},1/2 [0,v,0]$
2 e .2'.	$0,y,0 [u,0,w]$	$0,\bar{y},0 [u,0,\bar{w}]$
2 d 2'..	$x,0,1/2 [0,v,w]$	$\bar{x},0,1/2 [0,v,\bar{w}]$
2 c 2..	$x,0,0 [u,0,0]$	$\bar{x},0,0 [u,0,0]$
1 b 2'22'	$0,0,1/2 [0,v,0]$	
1 a 2'22'	$0,0,0 [u,0,0]$	

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p_{2a^*}2mm$	Along [010] $p_{2a^*}2mm$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,1/2$

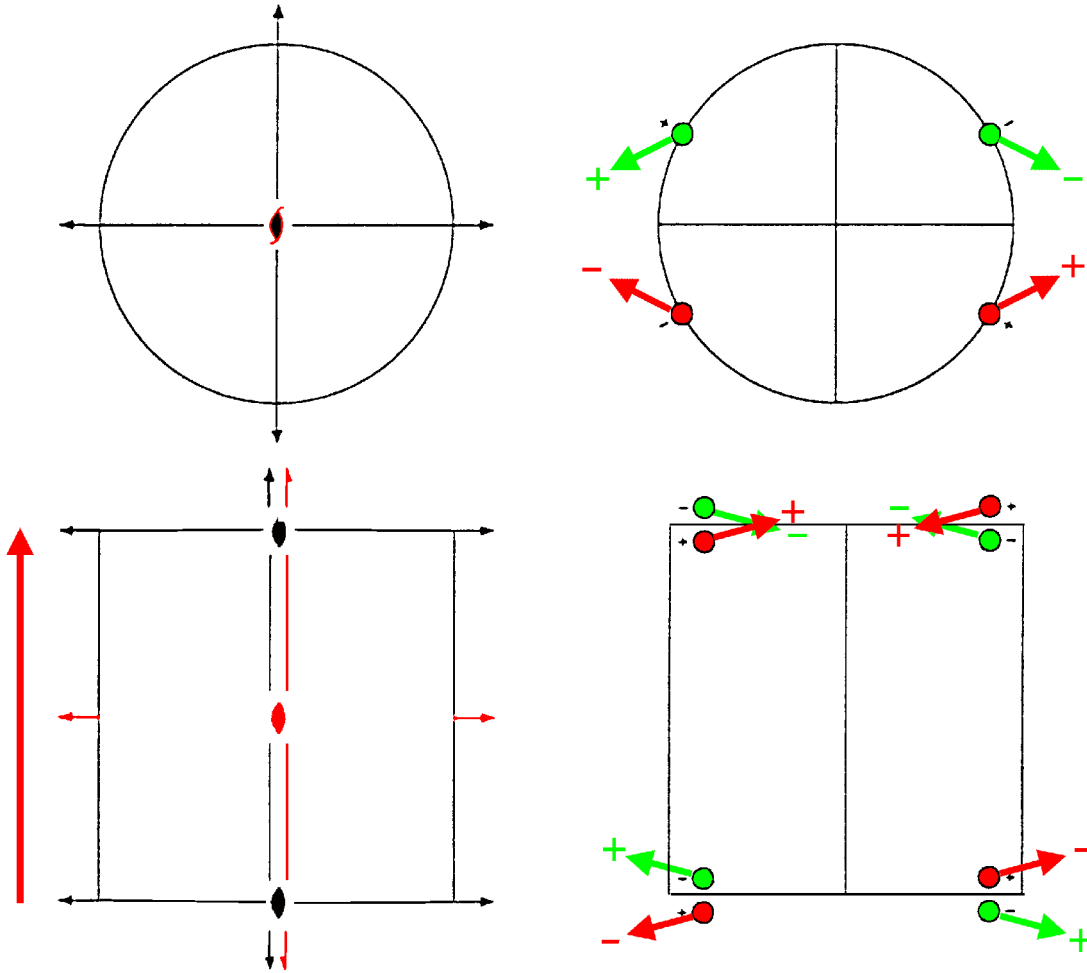
$p_{2c}222$

No. 13.6.61

2221'

$p_{2c}222$

Orthorhombic



Origin at 222

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For (0,0,0) + set

(1) 1	(2) 2 0,0,z	(3) 2 0,y,0	(4) 2 x,0,0
(1 0,0,0)	(2 _z 0,0,0)	(2 _y 0,0,0)	(2 _x 0,0,0)

For (0,0,1)' + set

(1) t' (0,0,1)	(2) 2' (0,0,1) 0,0,z	(3) 2' 0,y,1/2	(4) 2' x,0,1/2
(1 0,0,1)'	(2 _z 0,0,1)'	(2 _y 0,0,1)'	(2 _x 0,0,1)'

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		$(0,0,0)_+$ $(0,0,1)'$ +
4 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(4) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]
2 g ..2	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]
2 f .2'	$0,y,1/2$ [$u,0,w$]	$0,\bar{y},1/2$ [$\bar{u},0,w$]
2 e .2.	$0,y,0$ [$0,v,0$]	$0,\bar{y},0$ [$0,\bar{v},0$]
2 d 2'..	$x,0,1/2$ [$0,v,w$]	$\bar{x},0,1/2$ [$0,\bar{v},w$]
2 c 2..	$x,0,0$ [$u,0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]
1 b 2'2'2	$0,0,1/2$ [$0,0,w$]	
1 a 222	$0,0,0$ [$0,0,0$]	

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p_{2a^*}2m'm'$	Along [010] $p_{2a^*}2m'm'$
Origin at $0,0,z$	$\mathbf{a}^* = \mathbf{c}$ Origin at $x,0,0$	$\mathbf{a}^* = \mathbf{c}$ Origin at $0,y,0$

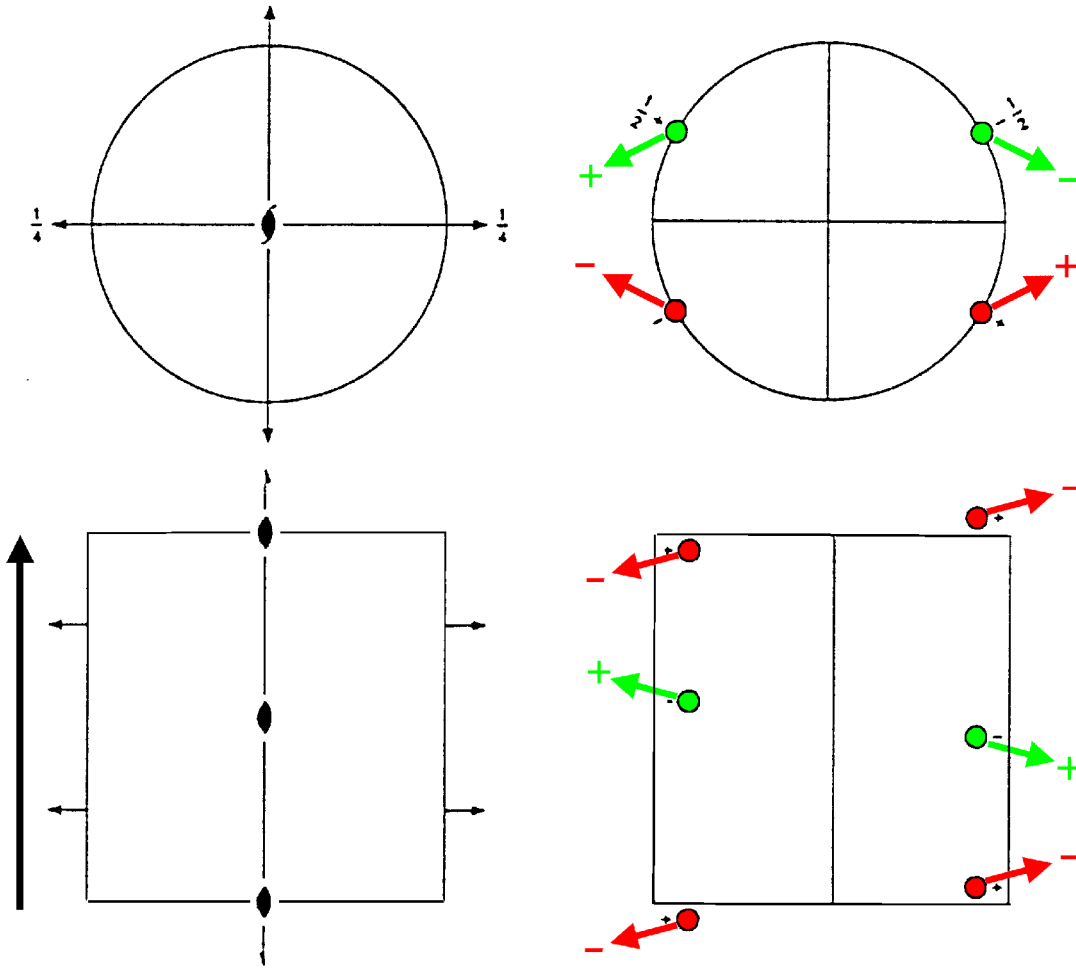
$p222_1$

222

Orthorhombic

No. 14.1.62

$p222_1$



Origin at 212_1

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1
 (1|0,0,0) (2) $2(0,0,1/2) \ 0,0,z$ (3) $2 \ 0,y,1/4$ (4) $2 \ x,0,0$
 (2_z|0,0,1/2) (2_y|0,0,1/2) (2_x|0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u, v, w]	(2) $\bar{x}, \bar{y}, z + 1/2$ [\bar{u}, \bar{v}, w]
4 c 1	(3) $\bar{x}, y, \bar{z} + 1/2$ [\bar{u}, v, \bar{w}]	(4) x, \bar{y}, \bar{z} [u, \bar{v}, \bar{w}]
2 b .2.	0, y, 1/4 [0, v, 0]	0, \bar{y} , 3/4 [0, \bar{v} , 0]
2 a 2..	x, 0, 0 [u, 0, 0]	\bar{x} , 0, 1/2 [\bar{u} , 0, 0]

Symmetry of special projections

Along [001] 2mm	Along [100] $p2m'g'$ $a^* = c$	Along [010] $p2m'g'$ $a^* = c$
Origin at 0, 0, z	Origin at x, 0, 0	Origin at 0, y, 1/4

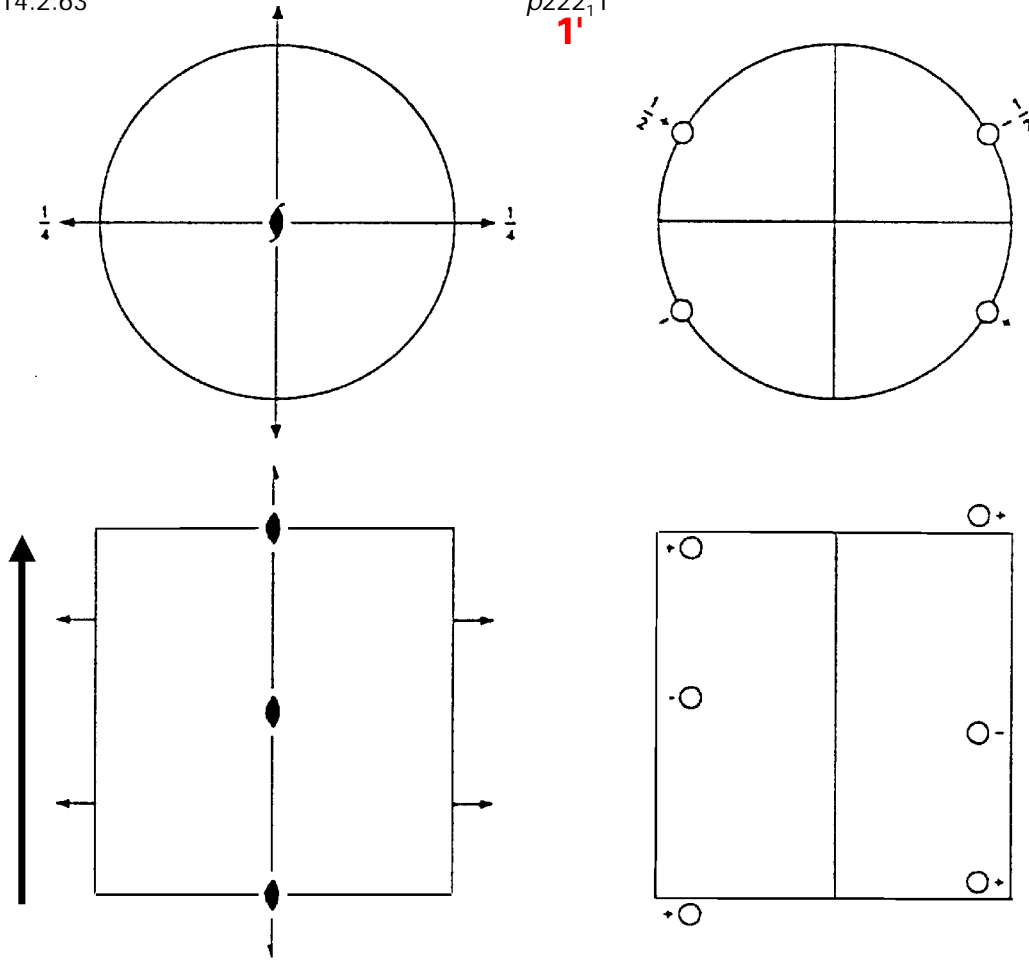
$p222_11'$

$2221'$

Orthorhombic

No. 14.2.63

$p222_11'$
1'



Origin at $212_11'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For 1 + set

(1) 1	(2) $2(0,0,1/2)$	$0,0,z$	(3) $2(0,y,1/4)$	(4) $2(x,0,0)$
$(1 0,0,0)$	$(2_z 0,0,1/2)$		$(2_y 0,0,1/2)$	$(2_x 0,0,0)$

For 1' + set

(1) 1'	(2) $2'(0,0,1/2)$	$0,0,z$	(3) $2'(0,y,1/4)$	(4) $2'(x,0,0)$
$(1 0,0,0)'$	$(2_z 0,0,1/2)'$		$(2_y 0,0,1/2)'$	$(2_x 0,0,0)'$

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		1+ 1' +
4 c 11'	(1) x,y,z [0,0,0]	(2) $\bar{x},\bar{y},z+1/2$ [0,0,0]
	(3) $\bar{x},y,\bar{z}+1/2$ [0,0,0]	(4) x,\bar{y},\bar{z} [0,0,0]
2 b .2.1'	$0,y,1/4$ [0,0,0]	$0,\bar{y},3/4$ [0,0,0]
2 a 2..1'	$x,0,0$ [0,0,0]	$\bar{x},0,1/2$ [0,0,0]

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p2mg1'$	Along [010] $p2mg1'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,1/4$

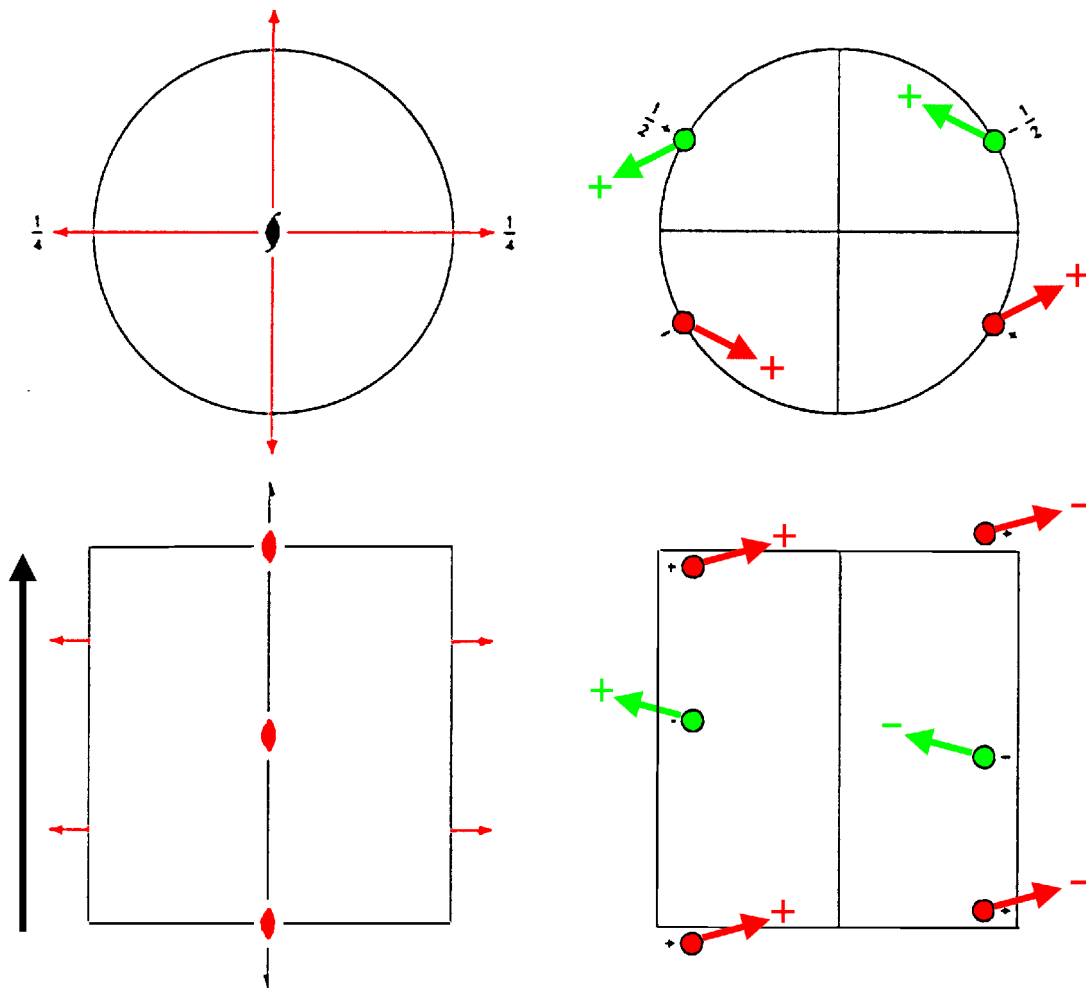
$p2'2'2_1$

$2'2'2$

Orthorhombic

No. 14.3.64

$p2'2'2_1$



Origin at $2'12_1$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1 (1|0,0,0) (2) $2(0,0,1/2)$ $0,0,z$ $(2_z|0,0,1/2)$ (3) $2'(0,y,1/4)$ $(2_y|0,0,1/2)'$ (4) $2'(x,0,0)$ $(2_x|0,0,0)'$

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u, v, w]	(2) $\bar{x}, \bar{y}, z + 1/2$ [\bar{u}, \bar{v}, w]
4 c 1	(3) $\bar{x}, y, \bar{z} + 1/2$ [u, \bar{v}, w]	(4) x, \bar{y}, \bar{z} [\bar{u}, v, w]
2 b .2'	$0, y, 1/4$ [u, 0, w]	$0, \bar{y}, 3/4$ [$\bar{u}, 0, w$]
2 a 2'..	$x, 0, 0$ [0, v, w]	$\bar{x}, 0, 1/2$ [0, \bar{v}, w]

Symmetry of special projections

Along [001] $2mm$	Along [100] $p2'mg'$ $a^* = c$	Along [010] $p2'mg'$ $a^* = c$
Origin at $0, 0, z$	Origin at $x, 0, 0$	Origin at $0, y, 1/4$

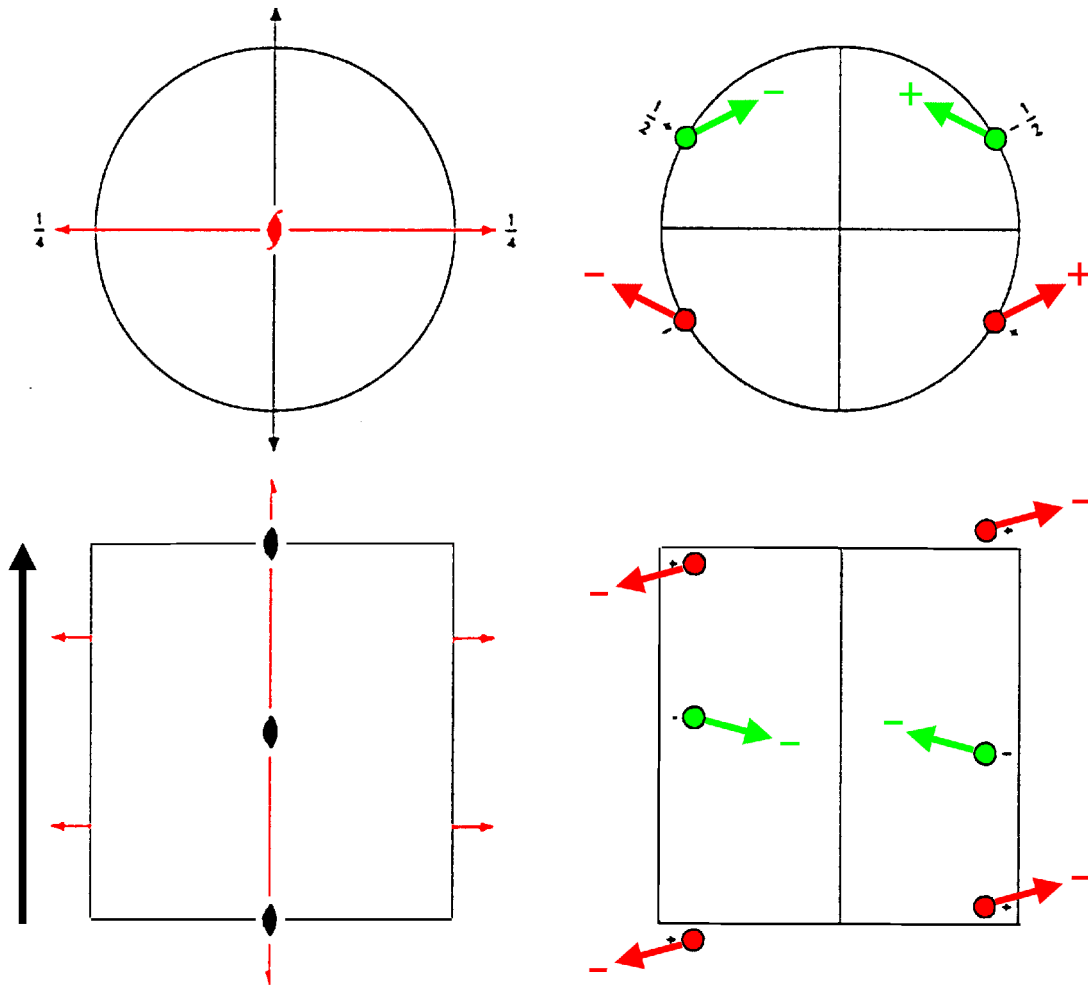
$p22'2_1'$

$22'2'$

Orthorhombic

No. 14.4.65

$p22'2_1'$



Origin at $212_1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1 (1|0,0,0) (2) $2' (0,0,1/2) 0,0,z$ ($2_z|0,0,1/2$)' (3) $2' 0,y,1/4$ ($2_y|0,0,1/2$)' (4) $2 x,0,0$ ($2_x|0,0,0$)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z $[u, v, w]$	(2) $\bar{x}, \bar{y}, z + 1/2$ $[u, v, \bar{w}]$
4 c 1	(3) $\bar{x}, y, \bar{z} + 1/2$ $[u, \bar{v}, w]$	(4) x, \bar{y}, \bar{z} $[u, \bar{v}, \bar{w}]$
2 b $2'$	$0, y, 1/4$ $[u, 0, w]$	$0, \bar{y}, 3/4$ $[u, 0, \bar{w}]$
2 a $2..$	$x, 0, 0$ $[u, 0, 0]$	$\bar{x}, 0, 1/2$ $[u, 0, 0]$

Symmetry of special projections

Along $[001]$ $2'mm'$	Along $[100]$ $p2mg$	Along $[010]$ $p2'm'g$
Origin at $0, 0, z$	$a^* = c$ Origin at $x, 0, 0$	$a^* = c$ Origin at $0, y, 1/4$

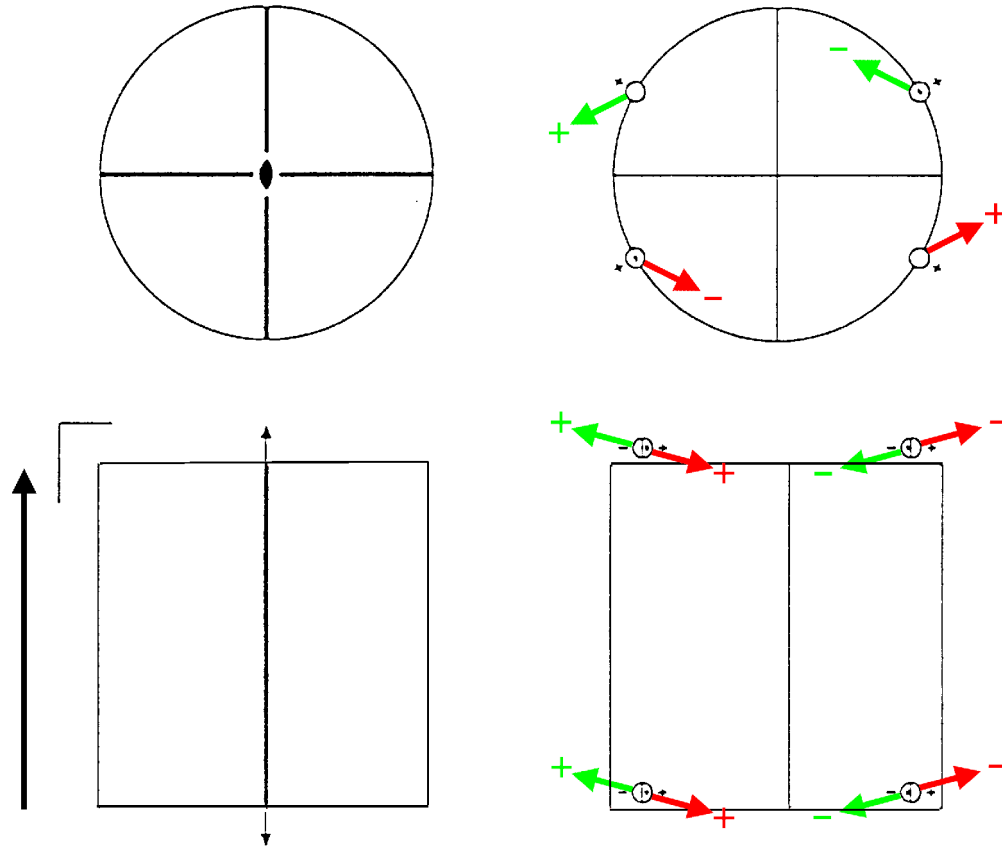
*pmm*2

No. 15.1.66

*mm*2

*pmm*2

Orthorhombic



Origin on *mm*2

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,0,z$
(2_z |0,0,0)

(3) m $x,0,z$
(m_y |0,0,0)

(4) m $0,y,z$
(m_x |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) x,\bar{y},z [\bar{u},v,\bar{w}]	(4) \bar{x},y,z [u,\bar{v},\bar{w}]
4 d 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) x,\bar{y},z [\bar{u},v,\bar{w}]	(4) \bar{x},y,z [u,\bar{v},\bar{w}]
2 c m..	0,y,z [u,0,0]	0, \bar{y} ,z [\bar{u} ,0,0]		
2 b .m.	x,0,z [0,v,0]	\bar{x} ,0,z [0, \bar{v} ,0]		
1 a mm2	0,0,z [0,0,0]			

Symmetry of special projections

Along [001] 2mm	Along [100] $p11m1'$ $a^* = c$	Along [010] $p11m1'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

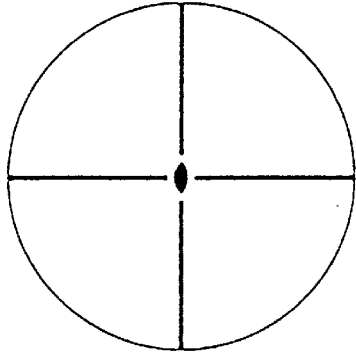
$pmm21'$

No. 15.2.67

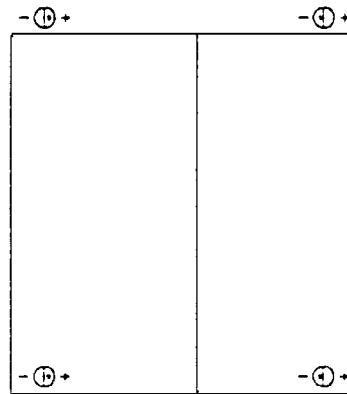
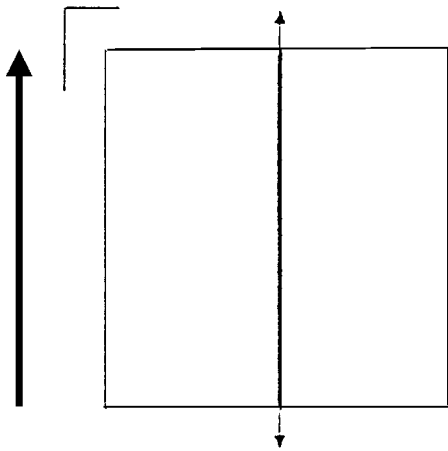
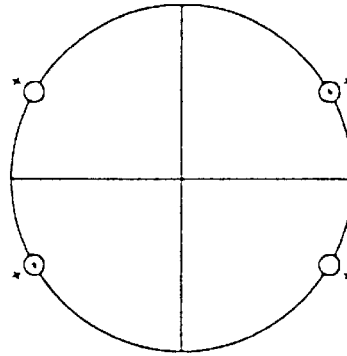
$mm21'$

$pmm21'$

Orthorhombic



$1'$



Origin on $mm21'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

(1) 1	(2) $2 \quad 0,0,z$	(3) $m \quad x,0,z$	(4) $m \quad 0,y,z$
$(1 0,0,0)$	$(2_z 0,0,0)$	$(m_y 0,0,0)$	$(m_x 0,0,0)$

For $1' +$ set

(1) $1'$	(2) $2' \quad 0,0,z$	(3) $m' \quad x,0,z$	(4) $m' \quad 0,y,z$
$(1 0,0,0)'$	$(2_z 0,0,0)'$	$(m_y 0,0,0)'$	$(m_x 0,0,0)'$

Generators selected (1); $t(0,0,1)$; (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		1+	1' +	
4 d 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$	(3) $x,\bar{y},z [0,0,0]$	(4) $\bar{x},y,z [0,0,0]$
2 c m..1'	$0,y,z [0,0,0]$	$0,\bar{y},z [0,0,0]$		
2 b .m.1'	$x,0,z [0,0,0]$	$\bar{x},0,z [0,0,0]$		
1 a mm21'	$0,0,z [0,0,0]$			

Symmetry of special projections

Along [001] 2mm1'	Along [100] p11m1'	Along [010] p11m1'
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at 0,y,0

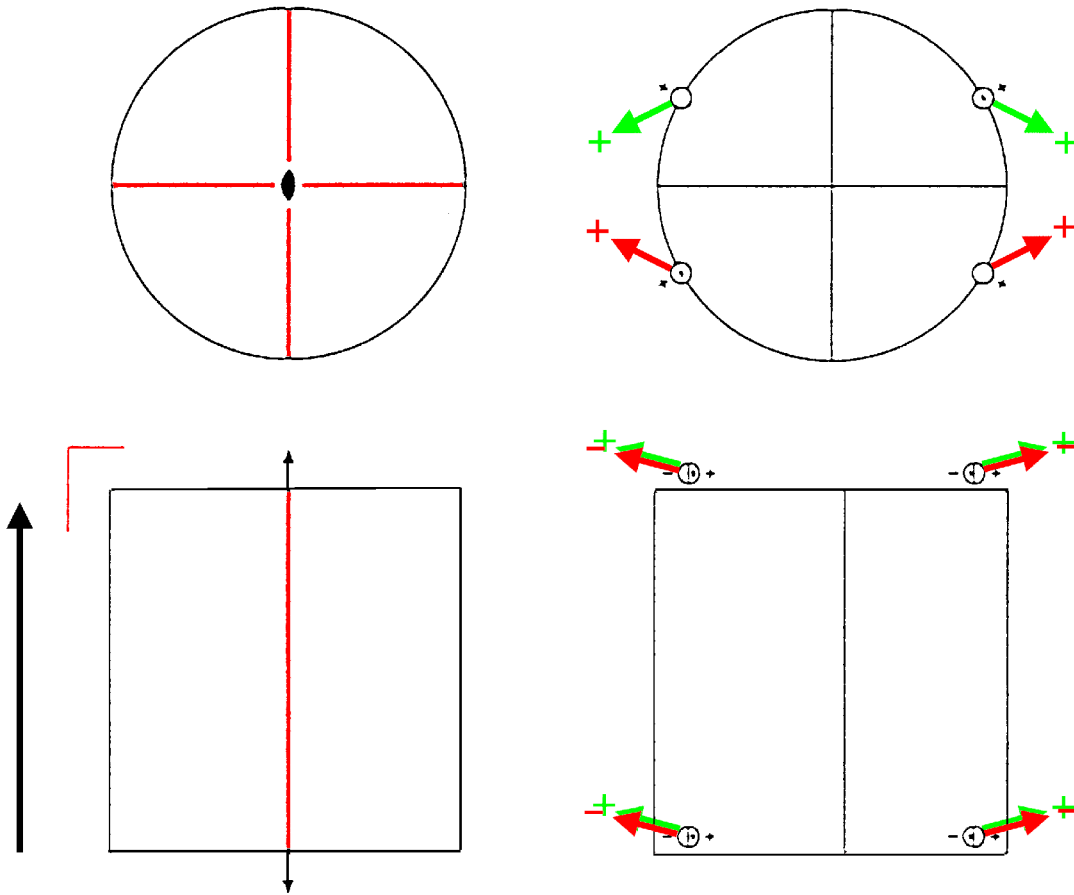
$pm'm'2$

No. 15.3.68

$m'm'2$

$pm'm'2$

Orthorhombic



Origin on $m'm'2$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2_{0,0,z}$
(2_z |0,0,0)

(3) m'_x x,0,z
(m_y |0,0,0)'

(4) m'_0 0,y,z
(m_x |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) x,\bar{y},z [u,\bar{v},w]	(4) \bar{x},y,z [\bar{u},v,w]
4 d 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) x,\bar{y},z [u,\bar{v},w]	(4) \bar{x},y,z [\bar{u},v,w]
2 c $m'..$	$0,y,z$ [$0,v,w$]	$0,\bar{y},z$ [$0,\bar{v},w$]		
2 b $.m'$	$x,0,z$ [$u,0,w$]	$\bar{x},0,z$ [$\bar{u},0,w$]		
1 a $m'm'2$	$0,0,z$ [$0,0,w$]			

Symmetry of special projections

Along [001] $2m'm'$	Along [100] $p11m'$	Along [010] $p11m'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

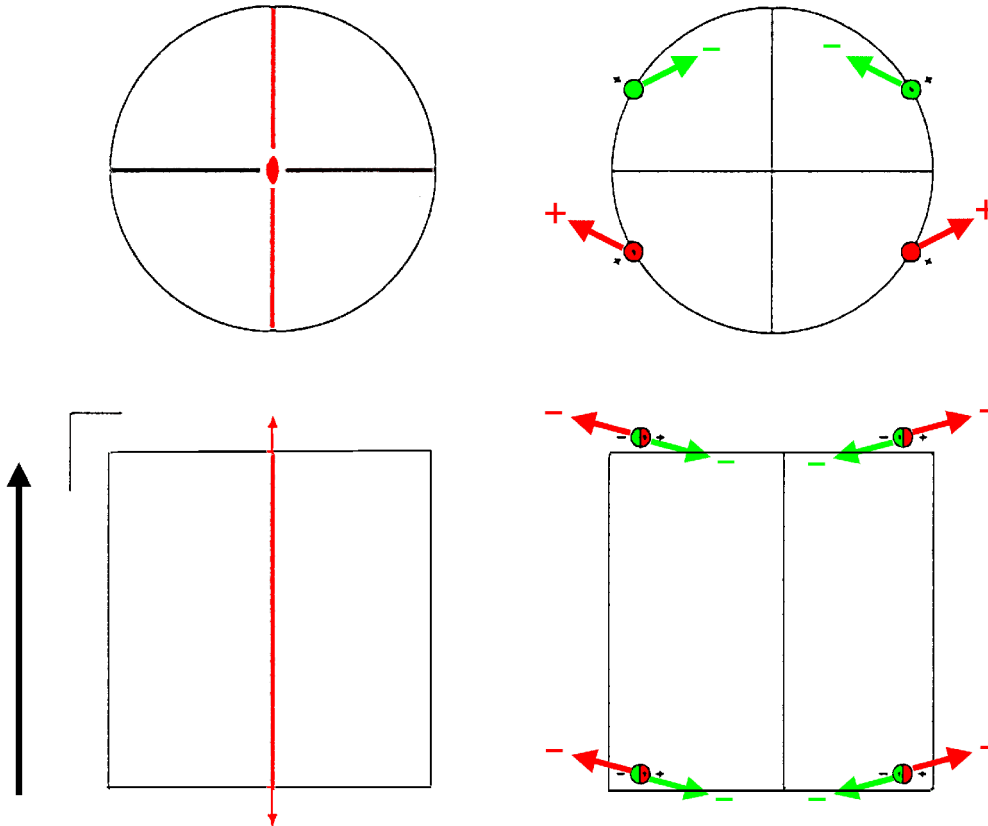
$pmm'2'$

No. 15.4.69

$mm'2'$

$pmm'2'$

Orthorhombic



Origin on $mm'2'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_z$ 0,0,z
(2_z |0,0,0)'

(3) m'_x x,0,z
(m_y |0,0,0)'

(4) m'_y 0,y,z
(m_x |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	(3) x,\bar{y},z [u, \bar{v} ,w]	(4) \bar{x},y,z [u, \bar{v} , \bar{w}]
4 d 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	(3) x,\bar{y},z [u, \bar{v} ,w]	(4) \bar{x},y,z [u, \bar{v} , \bar{w}]
2 c m..	0,y,z [u,0,0]	0, \bar{y} ,z [u,0,0]		
2 b .m'	x,0,z [u,0,w]	\bar{x} ,0,z [u,0, \bar{w}]		
1 a $mm'2'$	0,0,z [u,0,0]			

Symmetry of special projections

Along [001] $2'mm'$	Along [100] $p11m1'$	Along [010] $p11m$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at 0,y,0

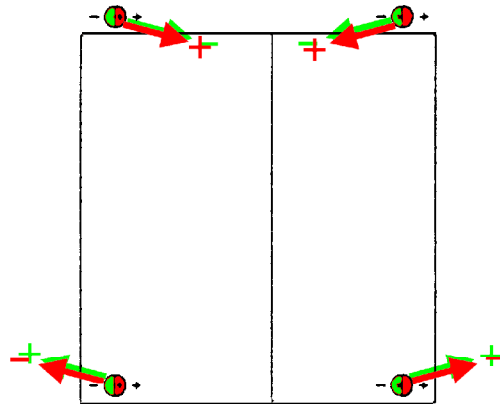
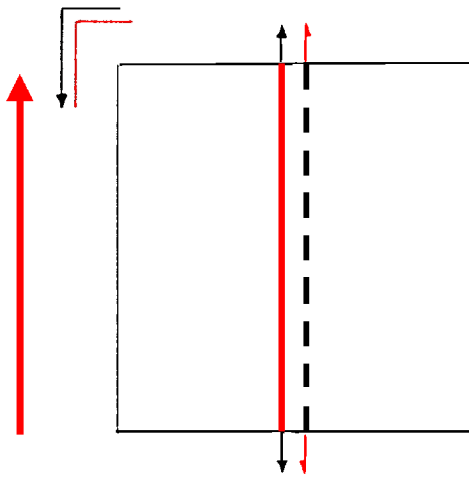
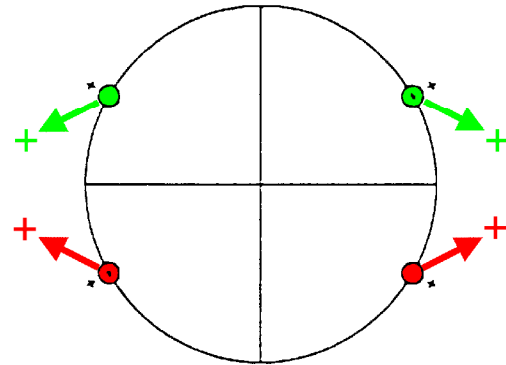
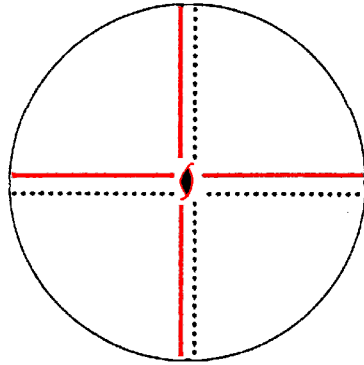
$p_{2c}m'm'2$

No. 15.5.70

$mm21'$

$p_{2c}m'm'2$

Orthorhombic



Origin on $m'm'2$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- For $(0,0,0) +$ set
- | | | | |
|-------------|-----------------|------------------|------------------|
| (1) 1 | (2) $2 \ 0,0,z$ | (3) $m' \ x,0,z$ | (4) $m' \ 0,y,z$ |
| $(1 0,0,0)$ | $(2_z 0,0,0)$ | $(m_y 0,0,0)'$ | $(m_x 0,0,0)'$ |
- For $(0,0,1)'$ + set
- | | | | |
|--------------------|----------------------------|---------------------------|---------------------------|
| (1) $t' \ (0,0,1)$ | (2) $2' \ (0,0,1) \ 0,0,z$ | (3) $c \ (0,0,1) \ x,0,z$ | (4) $c \ (0,0,1) \ 0,y,z$ |
| $(1 0,0,1)'$ | $(2_z 0,0,1)'$ | $(m_y 0,0,1)$ | $(m_x 0,0,1)$ |

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)'		
4	d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $x,\bar{y},z [u,\bar{v},w]$	(4) $\bar{x},y,z [\bar{u},v,w]$
2	c $m'..$	$0,y,z [0,v,w]$	$0,\bar{y},z [0,\bar{v},w]$		
2	b $.m'$	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$		
1	a $m'm'2$	$0,0,z [0,0,w]$			

Symmetry of special projections

Along [001] $2mm'1'$	Along [100] $p_{2a^*}11m'$	Along [010] $p_{2a^*}11m'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at 0,y,0

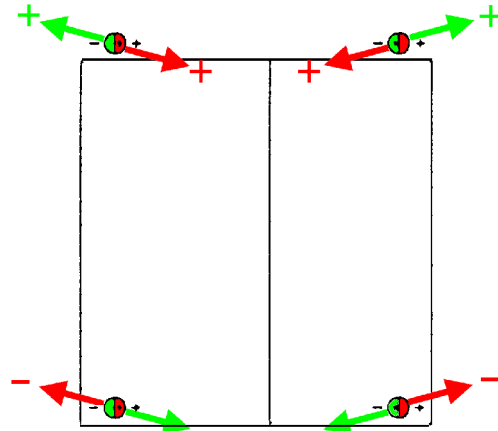
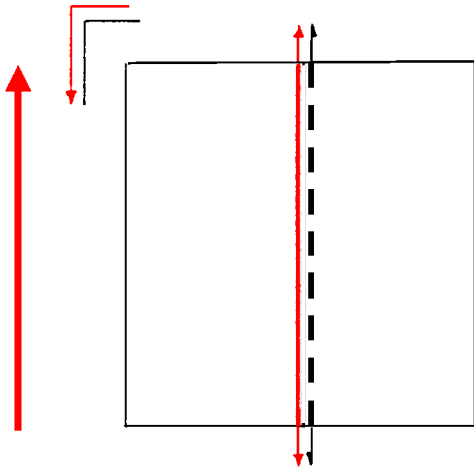
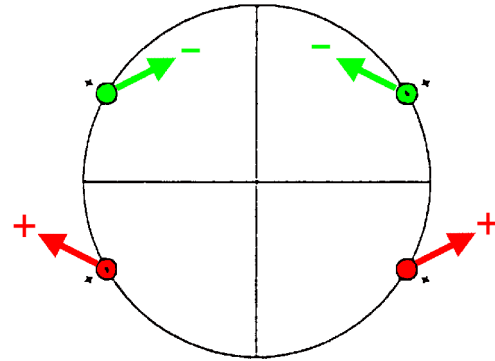
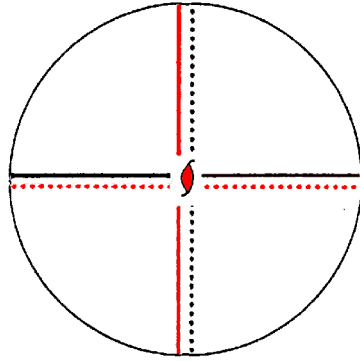
$\rho_{2c}mm'2'$

$mm21'$

Orthorhombic

No. 15.6.71

$\rho_{2c}mm'2'$



Origin on $mm'2'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- | | | | |
|----------------------|---------------------------|---------------------------|----------------------------|
| For $(0,0,0) +$ set | | | |
| (1) 1 | (2) $2' \ 0,0,z$ | (3) $m' \ x,0,z$ | (4) $m \ 0,y,z$ |
| $(1 0,0,0)$ | $(2_z 0,0,0)'$ | $(m_y 0,0,0)'$ | $(m_x 0,0,0)$ |
| For $(0,0,1)'$ + set | | | |
| (1) $t' \ (0,0,1)$ | (2) $2 \ (0,0,1) \ 0,0,z$ | (3) $c \ (0,0,1) \ x,0,z$ | (4) $c' \ (0,0,1) \ 0,y,z$ |
| $(1 0,0,1)'$ | $(2_z 0,0,1)$ | $(m_y 0,0,1)$ | $(m_x 0,0,1)'$ |

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(3) $x,\bar{y},z [u,\bar{v},w]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 d 1	$(0,0,0)_+$	$(0,0,1)'$	$(0,0,0)_+$	$(0,0,1)'$
2 c m..	$0,y,z [u,0,0]$	$0,\bar{y},z [u,0,0]$	$0,y,z [u,0,0]$	$0,\bar{y},z [u,0,0]$
2 b .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [u,0,\bar{w}]$	$x,0,z [u,0,w]$	$\bar{x},0,z [u,0,\bar{w}]$
1 a mm'2'	$0,0,z [u,0,0]$			

Symmetry of special projections

Along [001] $2mm'1'$	Along [100] $p11m'1'$	Along [010] $p_{2a^*}11m$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

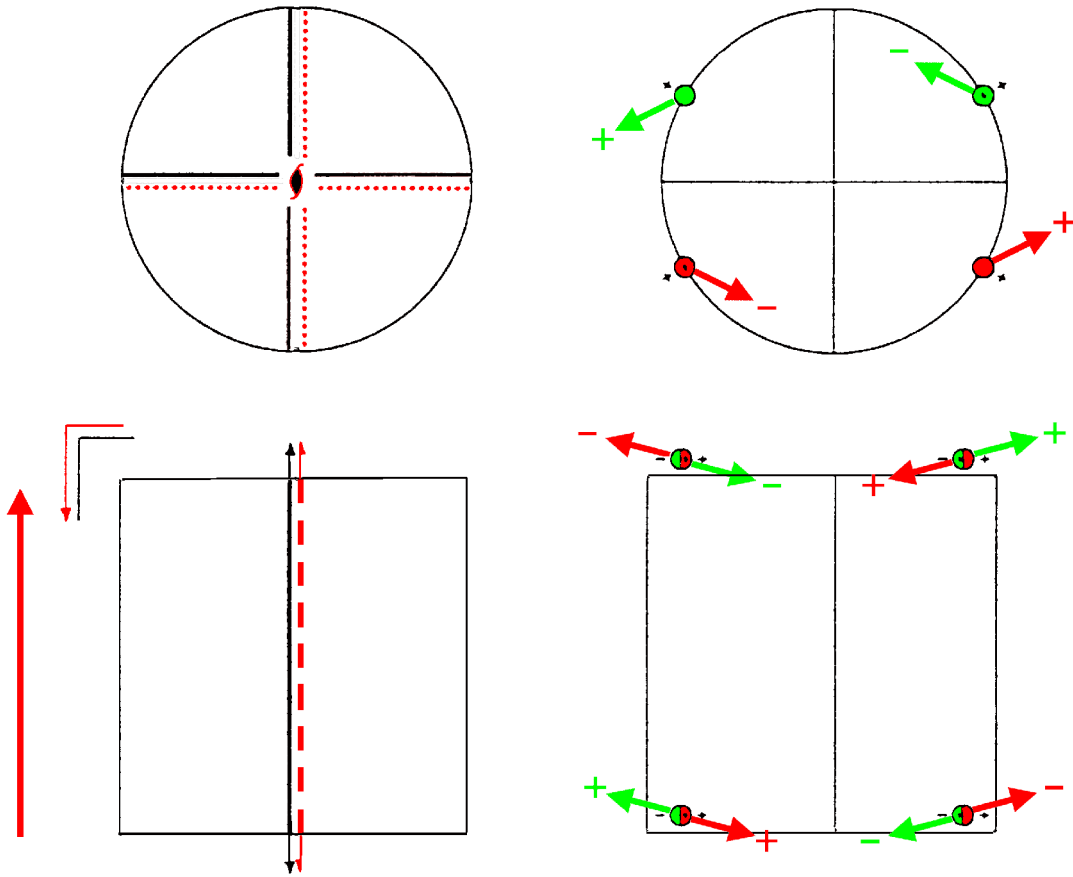
$p_{2c}mm2$

$mm21'$

Orthorhombic

No. 15.7.72

$p_{2c}mm2$



Origin on $mm2$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- For $(0,0,0) +$ set
- | | | | |
|-------------|-----------------|-----------------|-----------------|
| (1) 1 | (2) $2 \ 0,0,z$ | (3) $m \ x,0,z$ | (4) $m \ 0,y,z$ |
| $(1 0,0,0)$ | $(2_z 0,0,0)$ | $(m_y 0,0,0)$ | $(m_x 0,0,0)$ |
- For $(0,0,1)'$ + set
- | | | | |
|--------------------|----------------------------|----------------------------|----------------------------|
| (1) $t' \ (0,0,1)$ | (2) $2' \ (0,0,1) \ 0,0,z$ | (3) $c' \ (0,0,1) \ x,0,z$ | (4) $c' \ (0,0,1) \ 0,y,z$ |
| $(1 0,0,1)'$ | $(2_z 0,0,1)'$ | $(m_y 0,0,1)'$ | $(m_x 0,0,1)'$ |

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)'		
4	d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
2	c m..	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$		
2	b .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$		
1	a mm2	$0,0,z [0,0,0]$			

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p11m1'$	Along [010] $p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

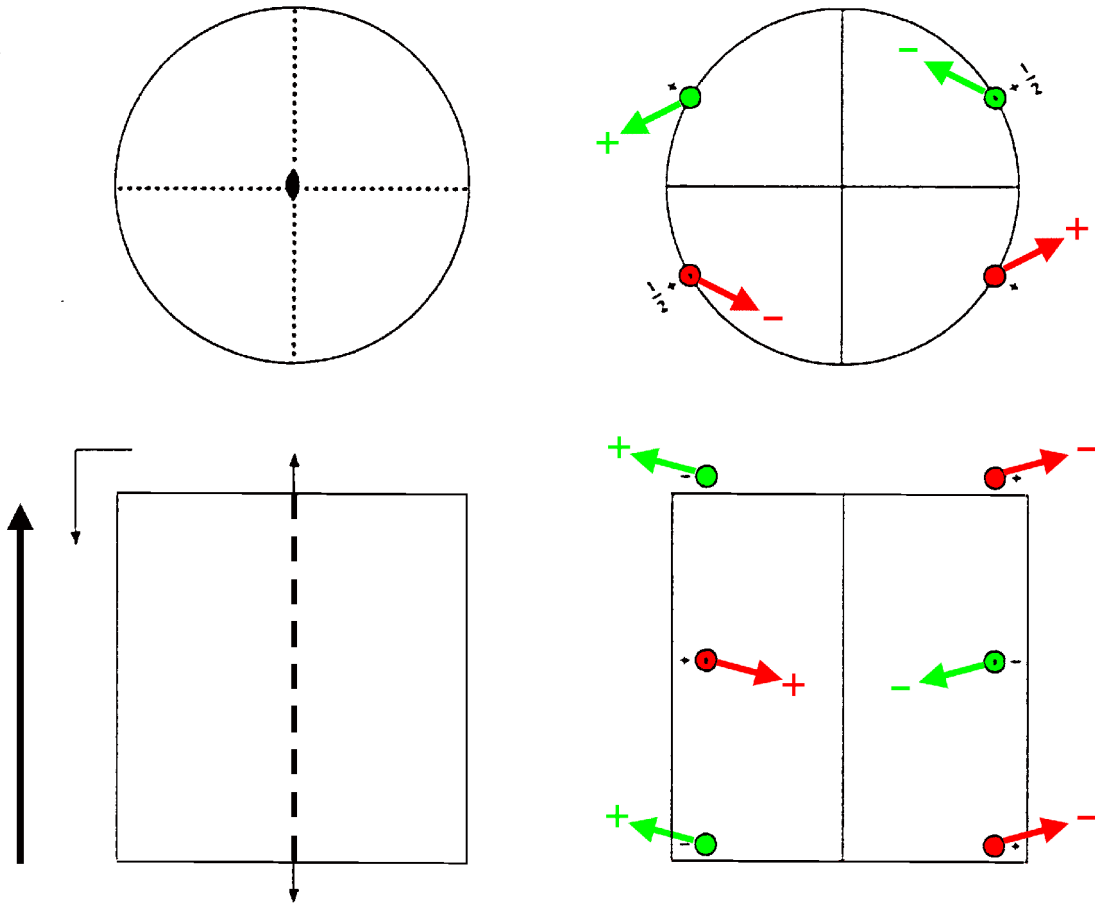
pcc2

mm2

Orthorhombic

No. 16.1.73

pcc2



Origin on *cc2*

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$

Symmetry operations

- | | | | |
|--------------------|----------------------------------|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) c $(0,0,1/2)$ $x,0,z$
(m_y 0,0,1/2) | (4) c $(0,0,1/2)$ $0,y,z$
(m_x 0,0,1/2) |
|--------------------|----------------------------------|--|--|

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 b 1	(3) $x,\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	(4) $\bar{x},y,z+1/2$ [u,\bar{v},\bar{w}]
1 a ..2	0,0,z [0,0,w]	0,0,z+1/2 [0,0, \bar{w}]

Symmetry of special projections

Along [001] 2mm	Along [100] $p_{2a^*}11m'$ $a^* = c/2$	Along [010] $p_{2a^*}11m'$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

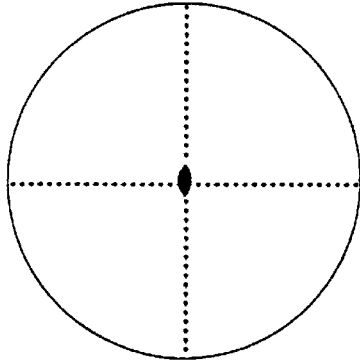
$pcc21'$

No. 16.2.74

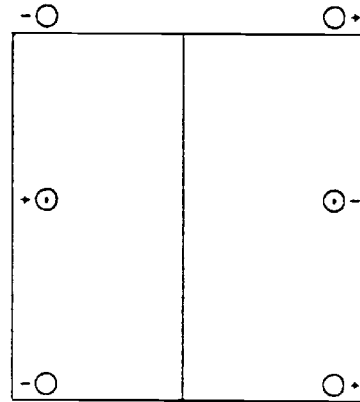
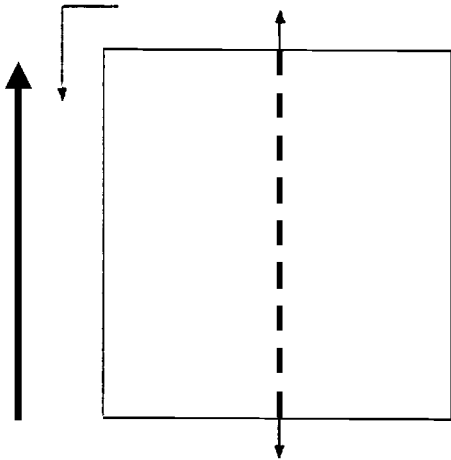
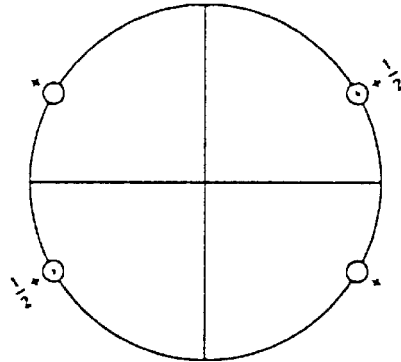
$mm21'$

$pcc21'$

Orthorhombic



$1'$



Origin on $cc21'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

(1) 1	(2) $2 \quad 0,0,z$	(3) $c \quad (0,0,1/2) \quad x,0,z$	(4) $c \quad (0,0,1/2) \quad 0,y,z$
(1 0,0,0)	(2 _z 0,0,0)	(m _y 0,0,1/2)	(m _x 0,0,1/2)

For $1' +$ set

(1) $1'$	(2) $2' \quad 0,0,z$	(3) $c' \quad (0,0,1/2) \quad x,0,z$	(4) $c' \quad (0,0,1/2) \quad 0,y,z$
(1 0,0,0)'	(2 _z 0,0,0)'	(m _y 0,0,1/2)'	(m _x 0,0,1/2)'

Generators selected (1); $t(0,0,1)$; (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 b 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $x,\bar{y},z+1/2 [0,0,0]$	(4) $\bar{x},y,z+1/2 [0,0,0]$
1 a ..21'	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p11m1'$ $a^* = c/2$	Along [010] $p11m1'$ $a^* = c/2$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

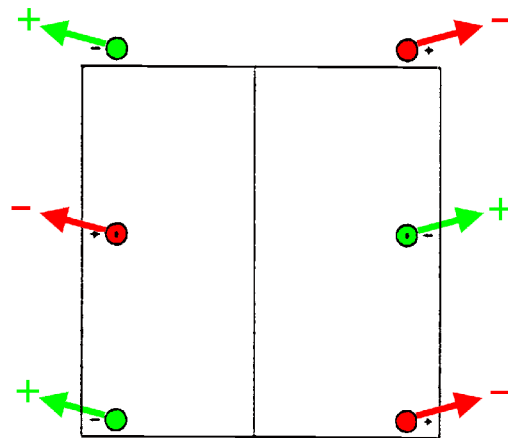
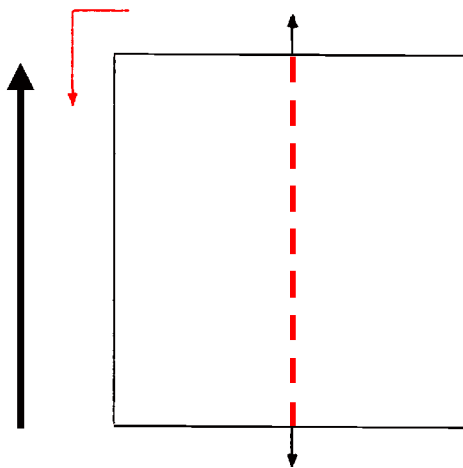
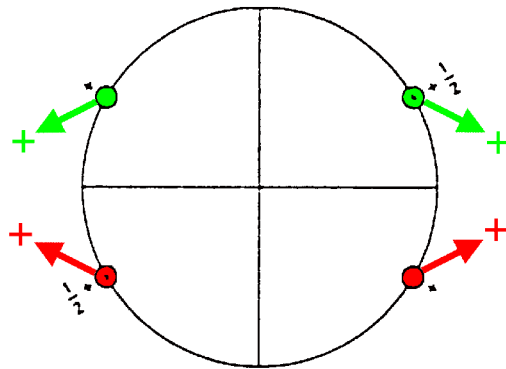
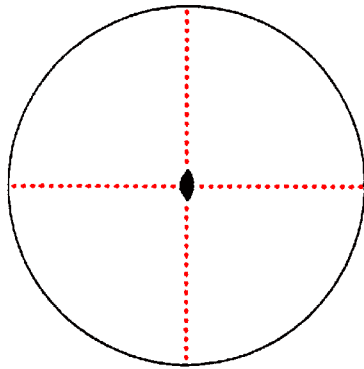
$pc'c'2$

$m'm'2$

Orthorhombic

No. 16.3.75

$pc'c'2$



Origin on $c'c'2$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) $2_{0,0,z}$
(2_z |0,0,0)
- (3) $c'(0,0,1/2)$ $x,0,z$
(m_y |0,0,1/2)'
- (4) $c'(0,0,1/2)$ $0,y,z$
(m_x |0,0,1/2)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 b 1	(3) $x,\bar{y},z+1/2$ [u, \bar{v},w]	(4) $\bar{x},y,z+1/2$ [\bar{u},v,w]
	1 a ..2	0,0,z [0,0,w]

Symmetry of special projections

Along [001] $2m'm'$	Along [100] $p11m'$	Along [010] $p11m'$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at 0,y,0

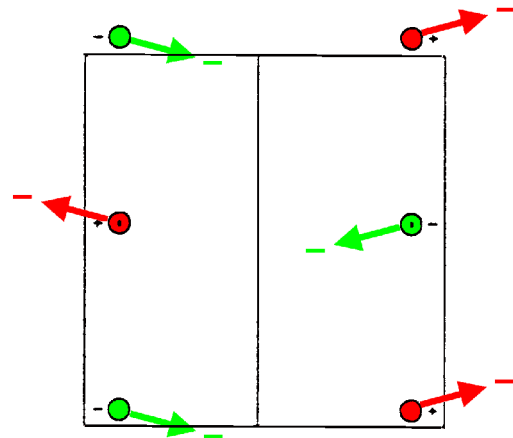
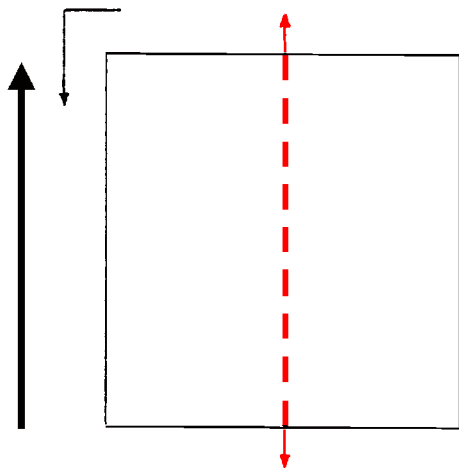
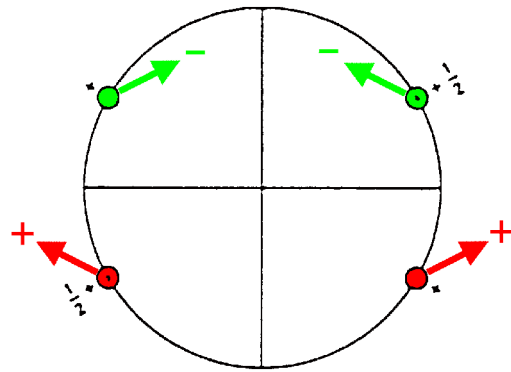
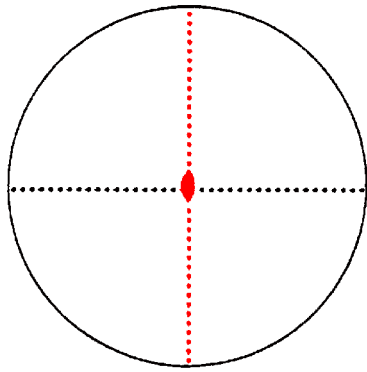
$pc'c'2'$

No. 16.4.76

$mm'2'$

$pc'c'2'$

Orthorhombic



Origin on $cc'2'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_z$ 0,0,z
($2'_z$ |0,0,0)

(3) c'_x (0,0,1/2) x,0,z
(m'_y |0,0,1/2)

(4) c'_y (0,0,1/2) 0,y,z
(m'_x |0,0,1/2)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$
	(3) $x,\bar{y},z+1/2 [u,\bar{v},w]$	(4) $\bar{x},y,z+1/2 [u,\bar{v},\bar{w}]$
1 a ..2'	$0,0,z [u,v,0]$	$0,0,z+1/2 [u,\bar{v},0]$

Symmetry of special projections

Along [001] $2'mm'$	Along [100] $p_{2a^*}11m$	Along [010] $p11m$
	$a^* = c/2$	$a^* = c/2$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

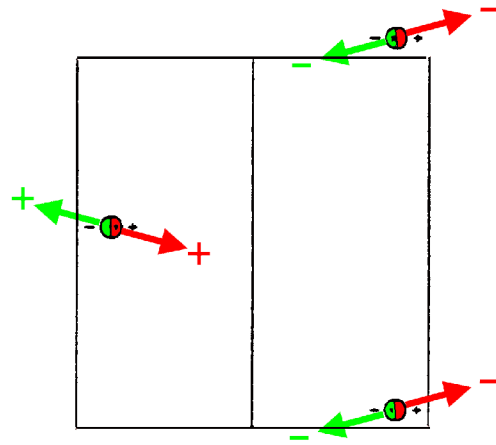
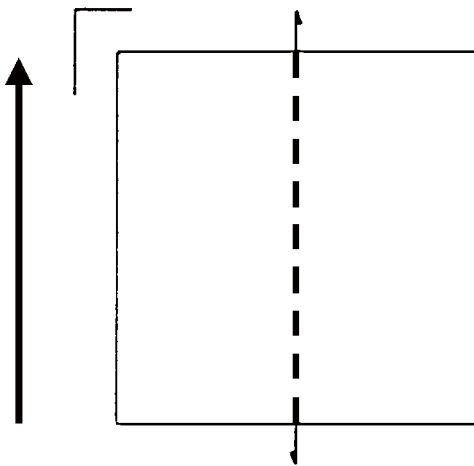
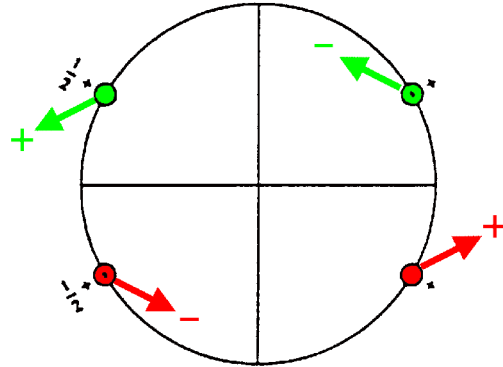
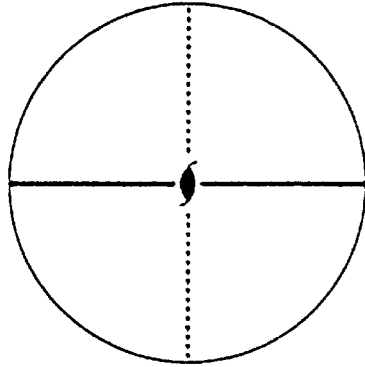
$pmc2_1$

$mm2$

Orthorhombic

No. 17.1.77

$pmc2_1$



Origin on $mc2_1$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) $2(0,0,1/2)$ $0,0,z$
 $(2_z|0,0,1/2)$
- (3) $c(0,0,1/2)$ $x,0,z$
 $(m_y|0,0,1/2)$
- (4) m $0,y,z$
 $(m_x|0,0,0)$

Generators selected (1); t(0,0,1); (2); (3)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 b 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]
	(3) $x,\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	(4) \bar{x},y,z [u,\bar{v},\bar{w}]
1 a m..	0,y,z [u,0,0]	0, \bar{y} ,z+1/2 [$\bar{u},0,0$]

Symmetry of special projections

Along [001] 2mm	Along [100] p11g1' a* = c	Along [010] p _{2a*} 11m a* = c/2
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

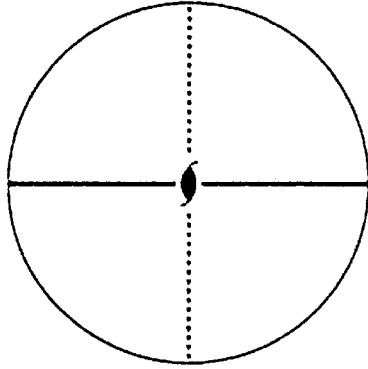
$pmc2_11'$

No. 17.2.78

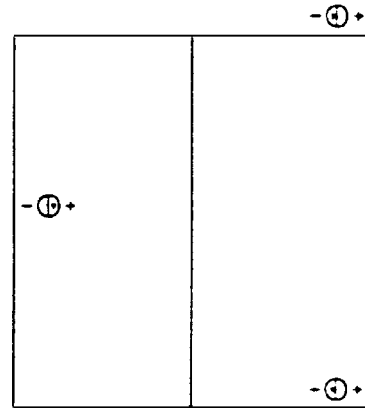
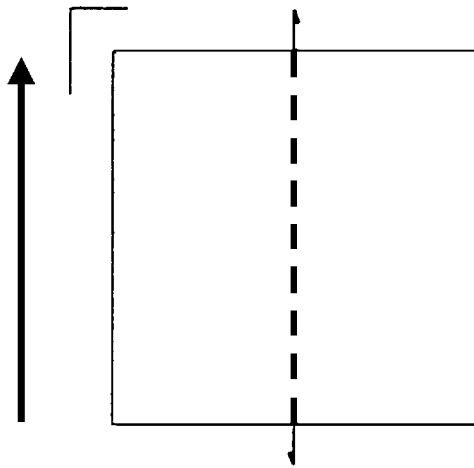
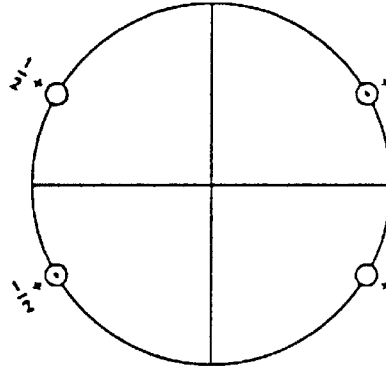
$mm21'$

$pmc2_11'$

Orthorhombic



$1'$



Origin on $mc2_11'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

- | | | | |
|--------------------------|--|--|------------------------------------|
| (1) 1
($1 0,0,0$) | (2) 2 ($0,0,\frac{1}{2}$) $0,0,z$
($2_z 0,0,\frac{1}{2}$) | (3) c ($0,0,\frac{1}{2}$) $x,0,z$
($m_y 0,0,\frac{1}{2}$) | (4) m $0,y,z$
($m_x 0,0,0$) |
|--------------------------|--|--|------------------------------------|

For $1' +$ set

- | | | | |
|----------------------------|--|--|--------------------------------------|
| (1) $1'$
($1 0,0,0'$) | (2) $2'$ ($0,0,\frac{1}{2}$) $0,0,z$
($2_z 0,0,\frac{1}{2}'$) | (3) c' ($0,0,\frac{1}{2}$) $x,0,z$
($m_y 0,0,\frac{1}{2}'$) | (4) m' $0,y,z$
($m_x 0,0,0'$) |
|----------------------------|--|--|--------------------------------------|

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1' +$
4 b $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z+1/2 [0,0,0]$
	(3) $x,\bar{y},z+1/2 [0,0,0]$	(4) $\bar{x},y,z [0,0,0]$
	1 a $m..1'$	$0,y,z [0,0,0]$

Symmetry of special projections

Along $[001]$ $2mm1'$	Along $[100]$ $p11g1'$	Along $[010]$ $p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c/2$ Origin at $0,y,0$

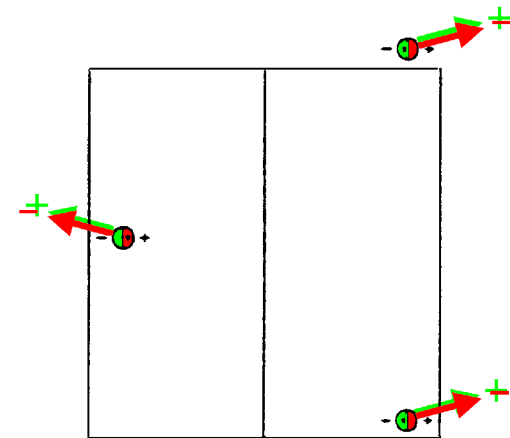
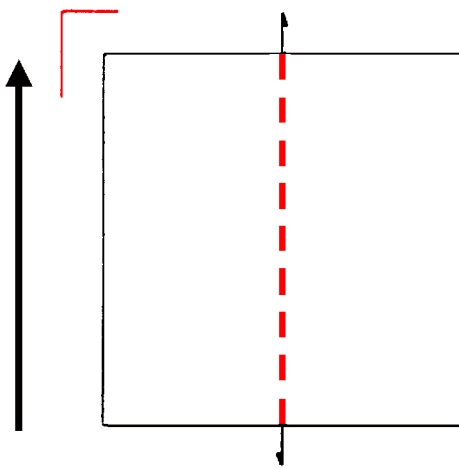
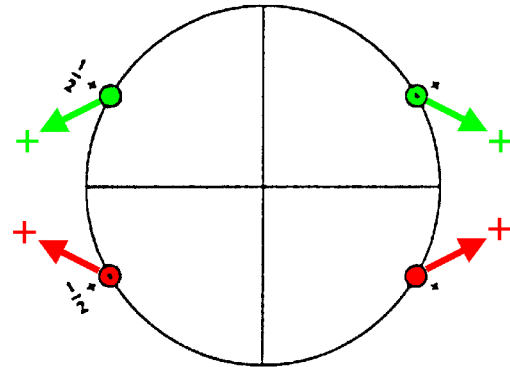
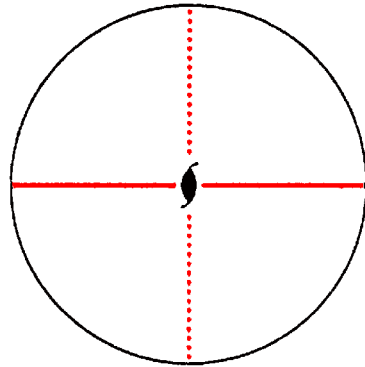
$pm'c'2_1$

$m'm'2$

Orthorhombic

No. 17.3.79

$pm'c'2_1$



Origin on $m'c'2_1$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1 (1|0,0,0) (2) 2 (0,0,1/2) 0,0,z (2_z|0,0,1/2) (3) c' (0,0,1/2) x,0,z (m_y|0,0,1/2)' (4) m' 0,y,z (m_x|0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]
4 b 1	(3) $x,\bar{y},z+1/2$ [u,\bar{v},w]	(4) \bar{x},y,z [\bar{u},v,w]
	1 a $m'..$	$0,y,z$ [u,0,0] $0,\bar{y},z+1/2$ [$\bar{u},0,0$]

Symmetry of special projections

Along [001] $2m'm'$	Along [100] $p11g'$	Along [010] $p11m'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at 0,y,0

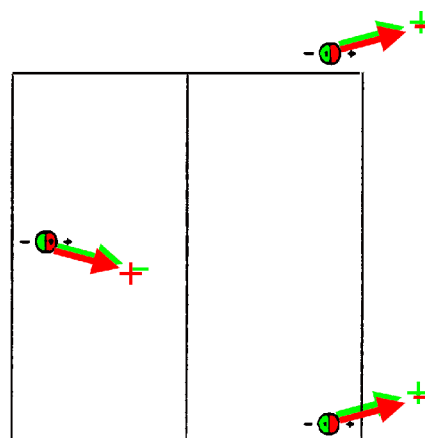
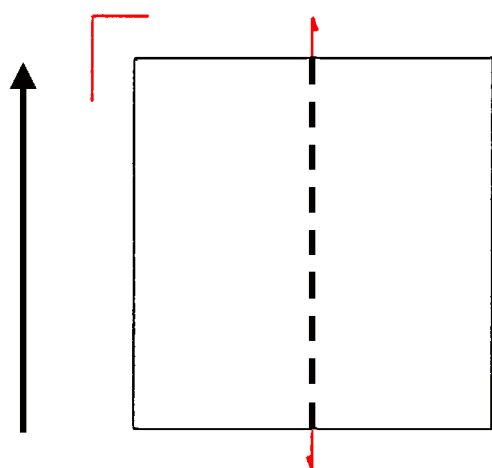
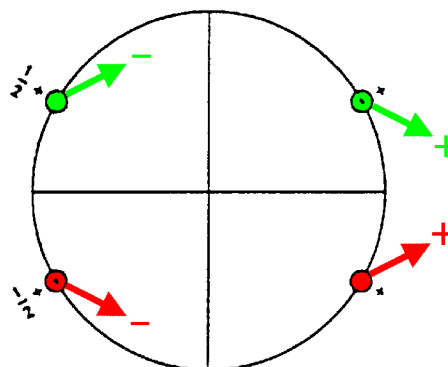
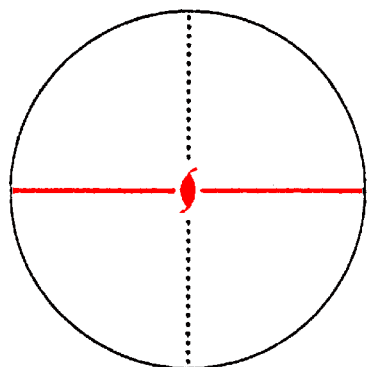
$pm'c2_1'$

No. 17.4.80

$m'm2'$

$pm'c2_1'$

Orthorhombic



Origin on $m'c2_1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- (1) 1
- (2) $2' (0,0, \frac{1}{2})$ $0,0,z$
- (3) $c (0,0, \frac{1}{2})$ $x,0,z$
- (4) $m' 0,y,z$
- (1|0,0,0)
- (2_z |0,0, $\frac{1}{2}$)'
- (m_y |0,0, $\frac{1}{2}$)
- (m_x |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 b 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]
	(3) $x,\bar{y},z+1/2$ [\bar{u} ,v, \bar{w}]	(4) \bar{x},y,z [\bar{u} ,v,w]
	1 a $m'..$	$0,y,z$ [0,v,w]
		$0,\bar{y},z+1/2$ [0,v, \bar{w}]

Symmetry of special projections

Along [001] $2mm$	Along [100] $p11g1'$ $a^* = c$	Along [010] $p_{2a^*}11m$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

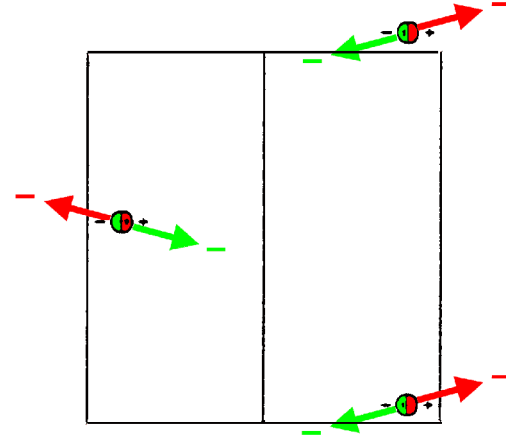
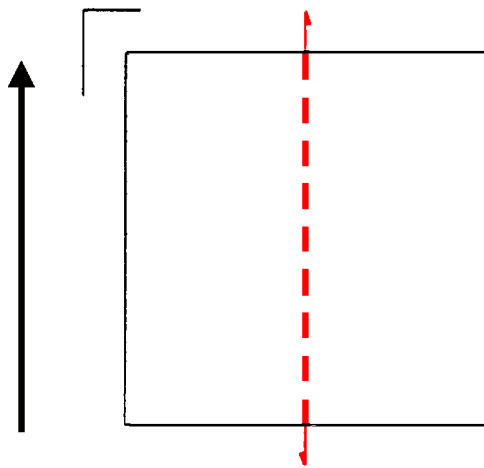
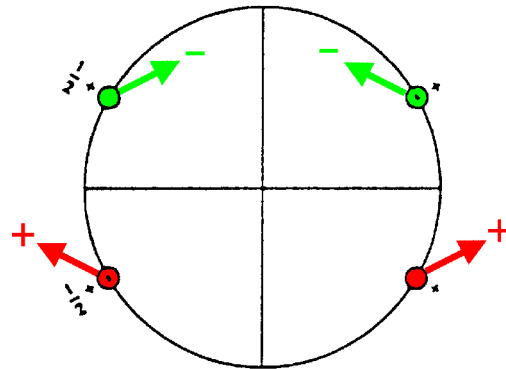
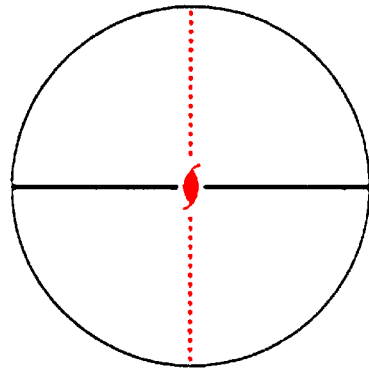
$pmc'2_1'$

No. 17.5.81

$mm'2'$

$pmc'2_1'$

Orthorhombic



Origin on $mc'2_1'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$

Symmetry operations

- (1) 1 (1|0,0,0) (2) 2 (0,0,1/2) 0,0,z (2_z|0,0,1/2)'
- (3) c' (0,0,1/2) x,0,z (m_y|0,0,1/2)' (4) m 0,y,z (m_x|0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z+1/2 [u,v,\bar{w}]$
	(3) $x,\bar{y},z+1/2 [u,\bar{v},w]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
1 a m..	$0,y,z [u,0,0]$	$0,\bar{y},z+1/2 [u,0,0]$

Symmetry of special projections

Along [001] $2'mm'$	Along [100] $p11g1'$	Along [010] $p11m$
	$a^* = c$	$a^* = c/2$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

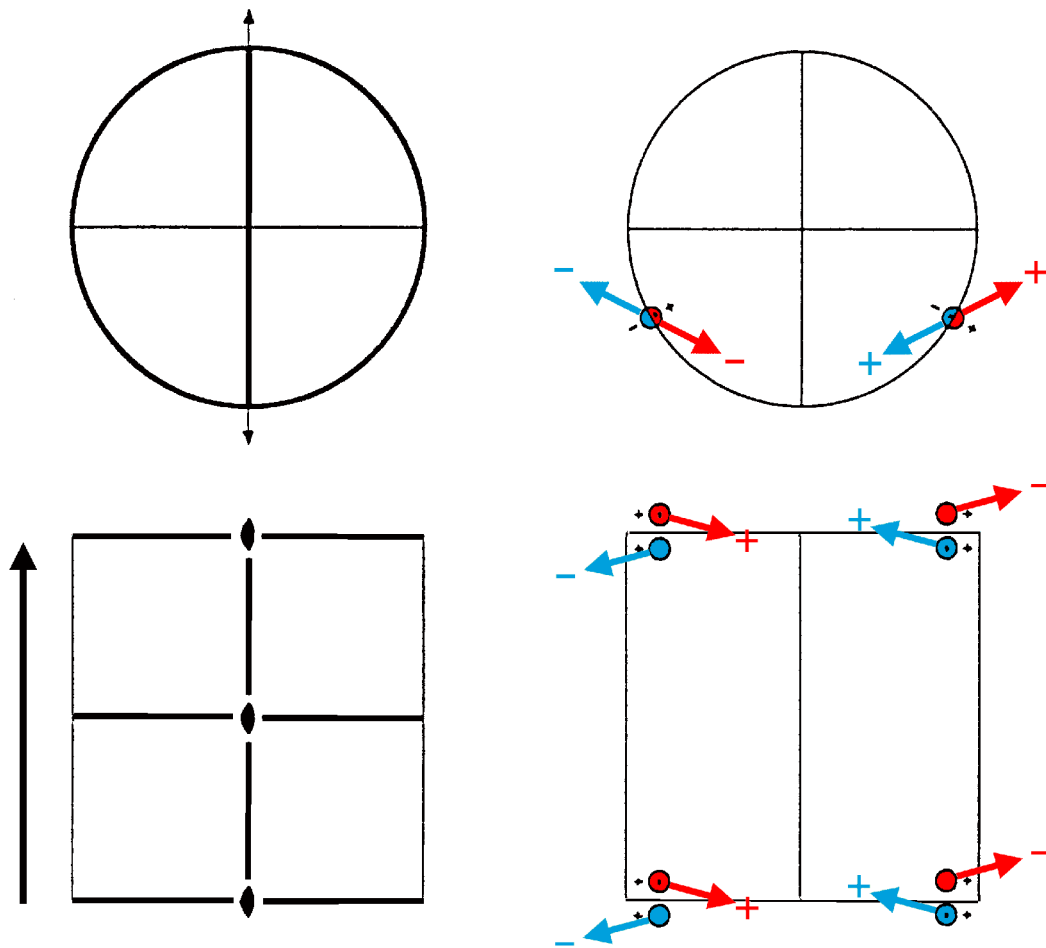
$p2mm$

No. 18.1.82

$2mm$

$p2mm$

Orthorhombic



Origin on $2mm$

Asymmetric unit $0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2 $x,0,0$
(2_x |0,0,0)
- (3) m $x,y,0$
(m_z |0,0,0)
- (4) m $x,0,z$
(m_y |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(3) x,y,\bar{z} [\bar{u},\bar{v},w]	(4) x,\bar{y},z [\bar{u},v,\bar{w}]
4 f 1	$(1) x,y,z$ [u,v,w]	$(2) x,\bar{y},\bar{z}$ [u,\bar{v},\bar{w}]	$(3) x,y,\bar{z}$ [\bar{u},\bar{v},w]	$(4) x,\bar{y},z$ [\bar{u},v,\bar{w}]
2 e .m.	$x,0,z$ [$0,v,0$]	$x,0,\bar{z}$ [$0,\bar{v},0$]		
2 d ..m	$x,y,1/2$ [$0,0,w$]	$x,\bar{y},1/2$ [$0,0,\bar{w}$]		
2 c ..m	$x,y,0$ [$0,0,w$]	$x,\bar{y},0$ [$0,0,\bar{w}$]		
1 b 2mm	$x,0,1/2$ [$0,0,0$]			
1 a 2mm	$x,0,0$ [$0,0,0$]			

Symmetry of special projections

Along [001] $11m1'$	Along [100] $p2mm$	Along [010] $p1m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

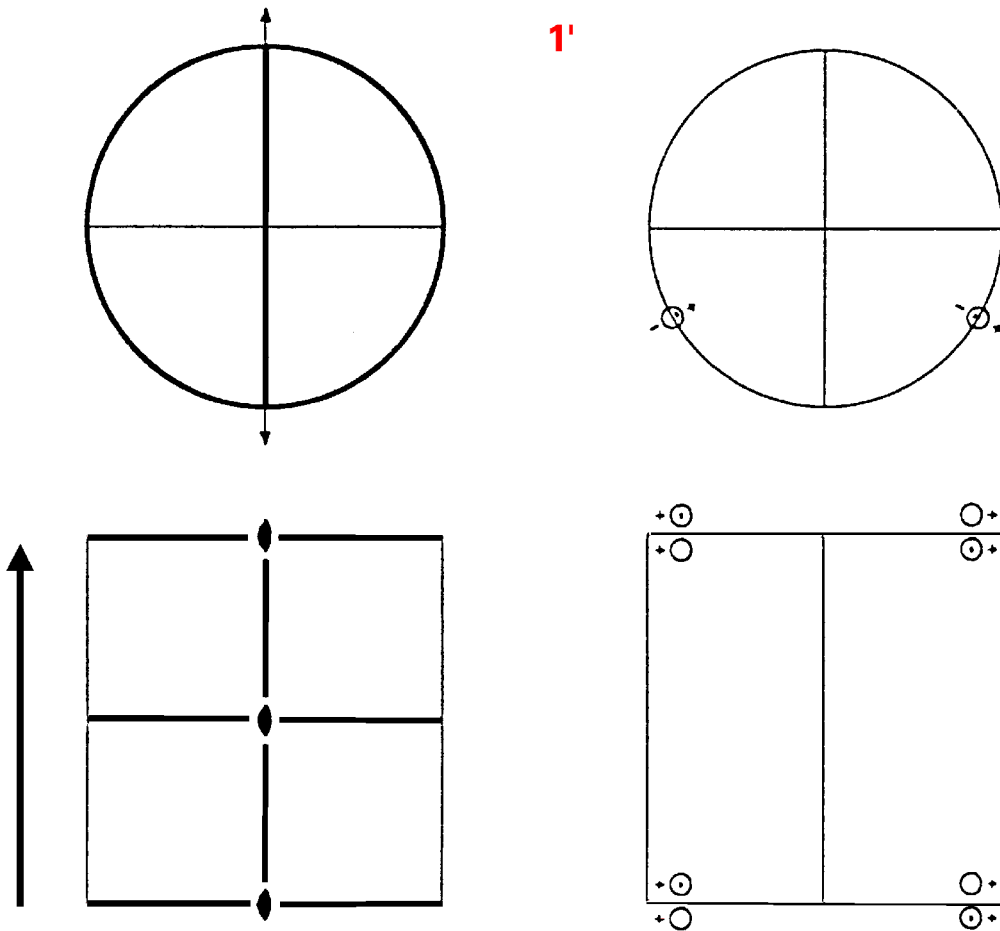
$p2mm1'$

No. 18.2.83

$2mm1'$

$p2mm1'$

Orthorhombic



Origin on $2mm1'$

Asymmetric unit $0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

(1) 1	(2) $2 \quad x,0,0$	(3) $m \quad x,y,0$	(4) $m \quad x,0,z$
$(1 0,0,0)$	$(2_x 0,0,0)$	$(m_z 0,0,0)$	$(m_y 0,0,0)$

For $1' +$ set

(1) $1'$	(2) $2' \quad x,0,0$	(3) $m' \quad x,y,0$	(4) $m' \quad x,0,z$
$(1 0,0,0)'$	$(2_x 0,0,0)'$	$(m_z 0,0,0)'$	$(m_y 0,0,0)'$

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		$1+$	$1' +$	
4 f $11'$	(1) $x,y,z [0,0,0]$	(2) $x,\bar{y},\bar{z} [0,0,0]$	(3) $x,y,\bar{z} [0,0,0]$	(4) $x,\bar{y},z [0,0,0]$
2 e $.m.1'$	$x,0,z [0,0,0]$	$x,0,\bar{z} [0,0,0]$		
2 d $..m1'$	$x,y,1/2 [0,0,0]$	$x,\bar{y},1/2 [0,0,0]$		
2 c $..m1'$	$x,y,0 [0,0,0] [0,0,0]$	$x,\bar{y},0 [0,0,0]$		
1 b $2mm1'$	$x,0,1/2 [0,0,0]$			
1 a $2mm1'$	$x,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $11m1'$	Along [100] $p2mm1'$	Along [010] $p1m11'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

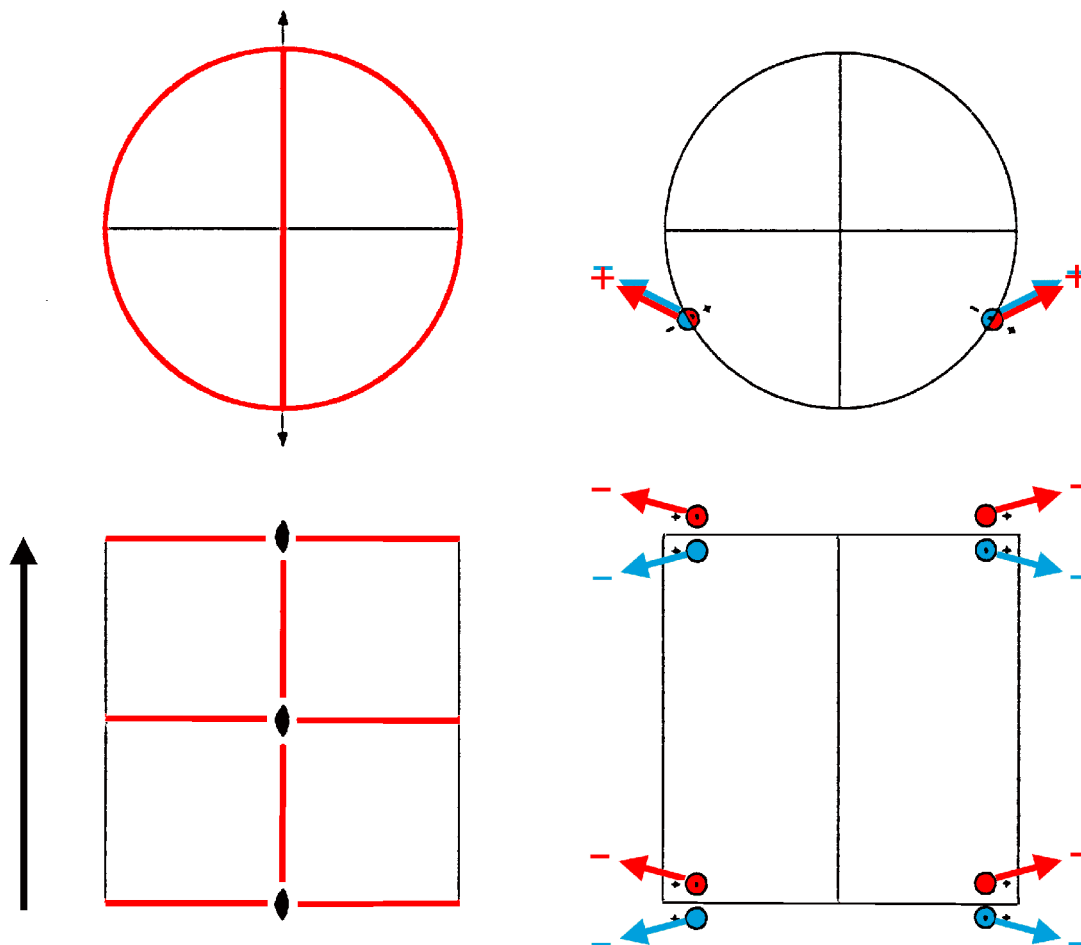
$p2m'm'$

No. 18.3.84

$2m'm'$

$p2m'm'$

Orthorhombic



Origin on $2m'm'$

Asymmetric unit $0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- (1) 1 (1|0,0,0) (2) 2 $x,0,0$ ($2_x|0,0,0$) (3) m' $x,y,0$ ($m_z|0,0,0$) (4) m' $x,0,z$ ($m_y|0,0,0$)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry					
4 f 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]	(3) x,y,\bar{z} [u,v, \bar{w}]	(4) x,\bar{y},z [u, \bar{v} ,w]	
2 e $.m'$	$x,0,z$ [u,0,w]	$x,0,\bar{z}$ [u,0, \bar{w}]			
2 d $.m'$	$x,y,1/2$ [u,v,0]	$x,\bar{y},1/2$ [u, \bar{v} ,0]			
2 c $.m'$	$x,y,0$ [u,v,0]	$x,\bar{y},0$ [u, \bar{v} ,0]			
1 b $2m'm'$	$x,0,1/2$ [u,0,0]				
1 a $2m'm'$	$x,0,0$ [u,0,0]				

Symmetry of special projections

Along [001] $11m'$	Along [100] $p2m'm'$	Along [010] $p1m'1$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at 0,y,0

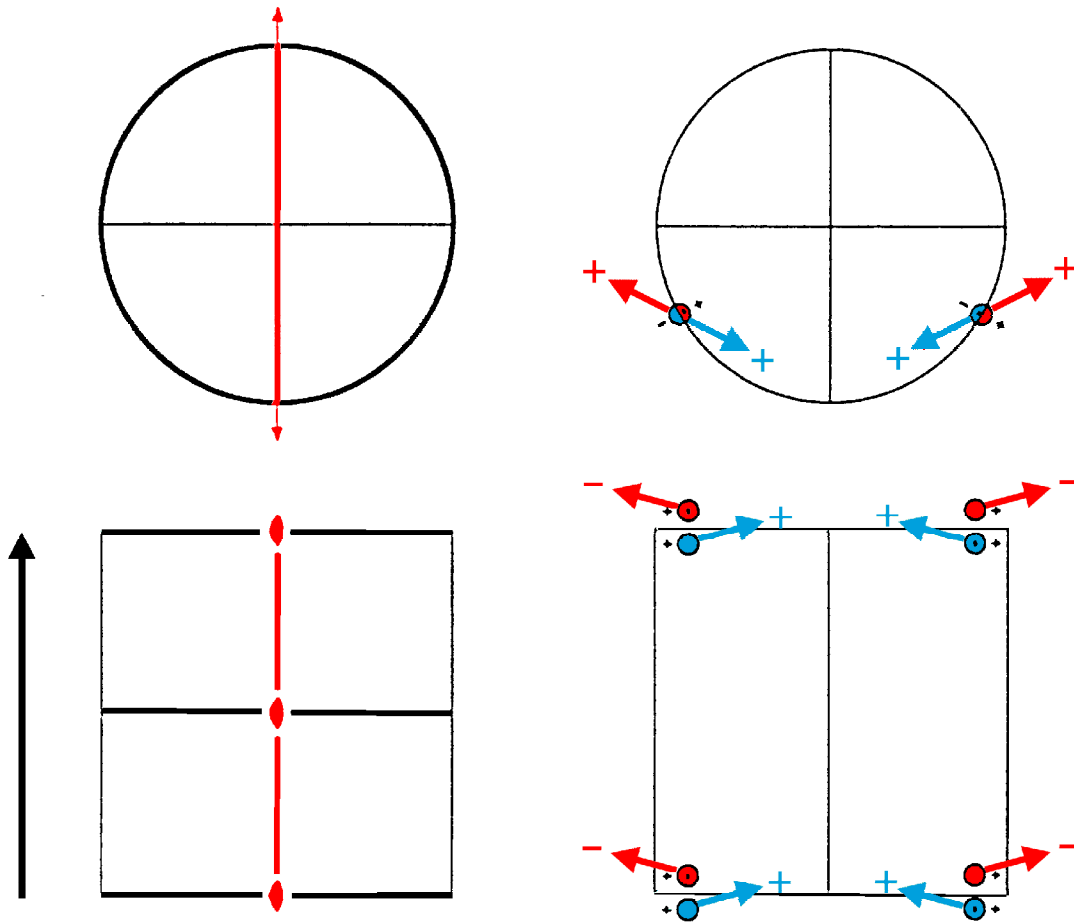
$p2'm'm$

No. 18.4.85

$2'm'm$

$p2'm'm$

Orthorhombic



Origin on $2'm'm$

Asymmetric unit $0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) $2'_x$ x,0,0
(2_x |0,0,0)'
- (3) m x,y,0
(m_z |0,0,0)
- (4) m'_x x,0,z
(m_y |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]	(3) x,y,\bar{z} [\bar{u},\bar{v},w]	(4) x,\bar{y},z [u,\bar{v},w]
4 f 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]	(3) x,y,\bar{z} [\bar{u},\bar{v},w]	(4) x,\bar{y},z [u,\bar{v},w]
2 e .m'	$x,0,z$ [$u,0,w$]	$x,0,\bar{z}$ [$\bar{u},0,w$]		
2 d ..m	$x,y,1/2$ [$0,0,w$]	$x,\bar{y},1/2$ [$0,0,w$]		
2 c ..m	$x,y,0$ [$0,0,w$]	$x,\bar{y},0$ [$0,0,w$]		
1 b 2'm'm	$x,0,1/2$ [$0,0,w$]			
1 a 2'm'm	$x,0,0$ [$0,0,w$]			

Symmetry of special projections

Along [001] $11m1'$	Along [100] $p2'mm'$	Along [010] $p1m1$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

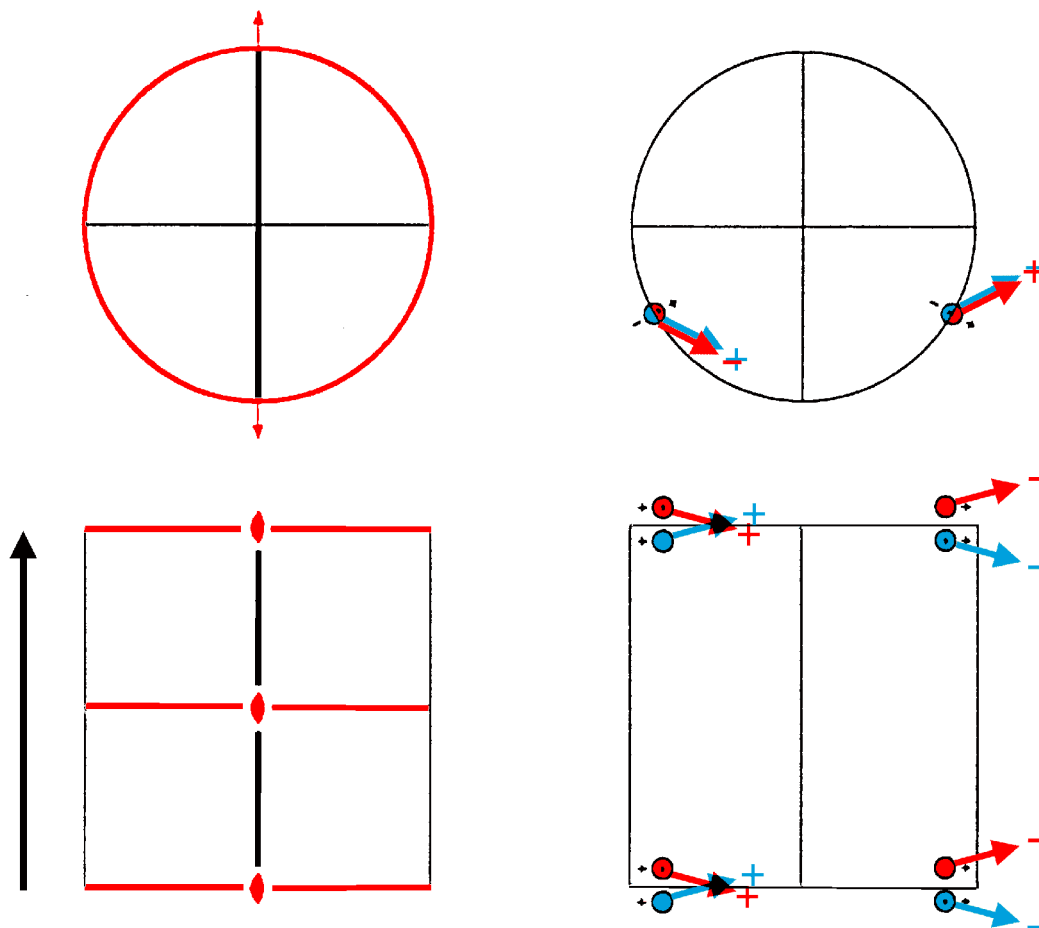
$p2'mm'$

No. 18.5.86

$2'mm'$

$p2'mm'$

Orthorhombic



Origin on $2'mm'$

Asymmetric unit $0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- (1) 1 (2) $2' \ x,0,0$ (3) $m' \ x,y,0$ (4) $m \ x,0,z$
 (1|0,0,0) (2_x|0,0,0)' (m_z|0,0,0)' (m_y|0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u} ,v,w]	(3) x,y,\bar{z} [u,v, \bar{w}]	(4) x,\bar{y},z [\bar{u} ,v, \bar{w}]
4 f 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u} ,v,w]	(3) x,y,\bar{z} [u,v, \bar{w}]	(4) x,\bar{y},z [\bar{u} ,v, \bar{w}]
2 e .m.	$x,0,z$ [0,v,0]	$x,0,\bar{z}$ [0,v,0]		
2 d ..m'	$x,y,1/2$ [u,v,0]	$x,\bar{y},1/2$ [\bar{u} ,v,0]		
2 c ..m'	$x,y,0$ [u,v,0]	$x,\bar{y},0$ [\bar{u} ,v,0]		
1 b 2'mm'	$x,0,1/2$ [0,v,0]			
1 a 2'mm'	$x,0,0$ [0,v,0]			

Symmetry of special projections

Along [001] 11m	Along [100] $p2'm'm$ $a^* = c$	Along [010] $p1m11'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

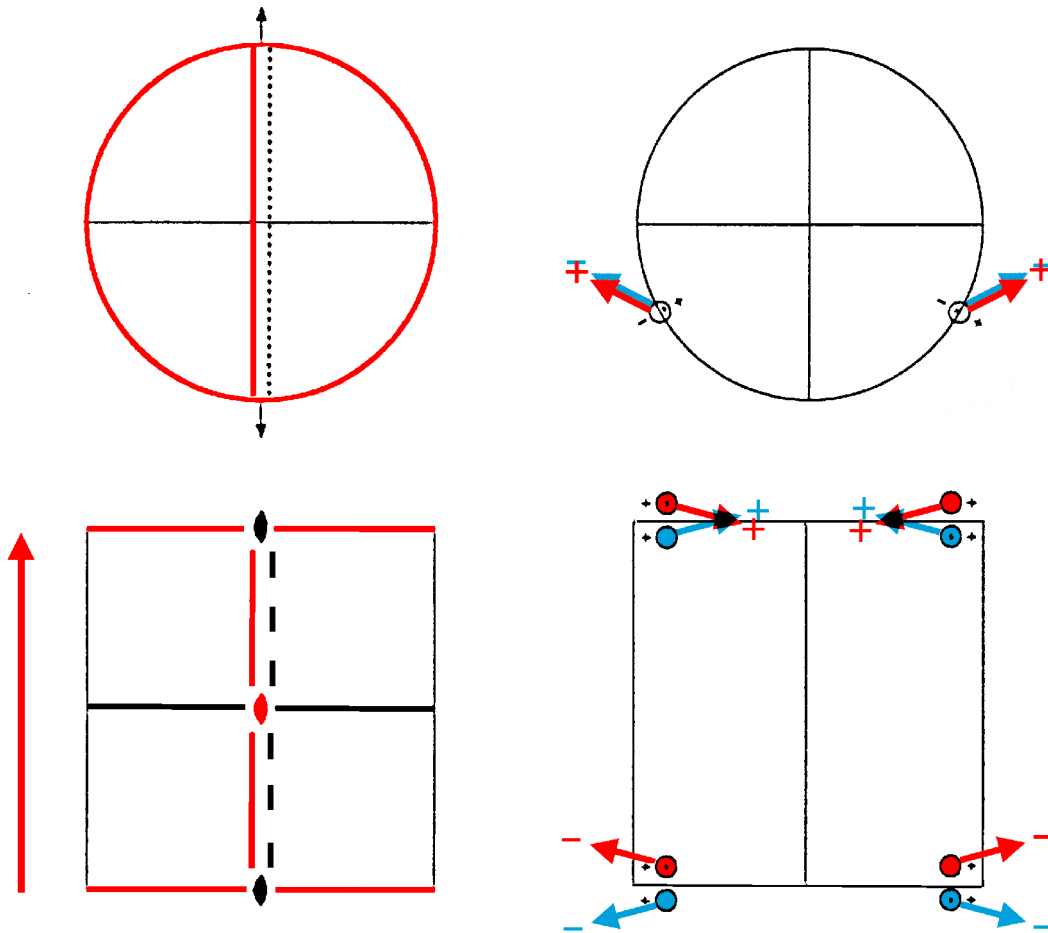
$\rho_{2c}2m'm'$

No. 18.6.87

$2mm1'$

$\rho_{2c}2m'm'$

Orthorhombic



Origin on $2m'm'$

Asymmetric unit $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) 2_x $x,0,0$	(3) m'_z $x,y,0$	(4) m'_y $x,0,z$
(1 $0,0,0$)	(2 $_x$ $0,0,0$)	(m'_z $0,0,0$)'	(m'_y $0,0,0$)'

For $(0,0,1)'$ + set

(1) t' $(0,0,1)$	(2) $2'_x$ $x,0,1/2$	(3) m_x $x,y,1/2$	(4) c $(0,0,1)$ $x,0,z$
(1 $0,0,1$)'	(2 $_x$ $0,0,1$)'	(m_x $0,0,1$)	(m_y $0,0,1$)

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		$(0,0,0)_+$	$(0,0,1)'$	+
4 f 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$	(3) $x,y,\bar{z} [u,v,\bar{w}]$	(4) $x,\bar{y},z [u,\bar{v},w]$
2 e $..m'$	$x,0,z [u,0,w]$	$x,0,\bar{z} [u,0,\bar{w}]$		
2 d $..m$	$x,y,1/2 [0,0,w]$	$x,\bar{y},1/2 [0,0,w]$		
2 c $..m'$	$x,y,0 [u,v,0]$	$x,\bar{y},0 [u,\bar{v},0]$		
1 b $2'm'm$	$x,0,1/2 [0,0,w]$			
1 a $2m'm'$	$x,0,0 [u,0,0]$			

Symmetry of special projections

Along [001] $11m1'$	Along [100] $p_{2a^*}2m'm'$	Along [010] $p_{2a^*}1m'1$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

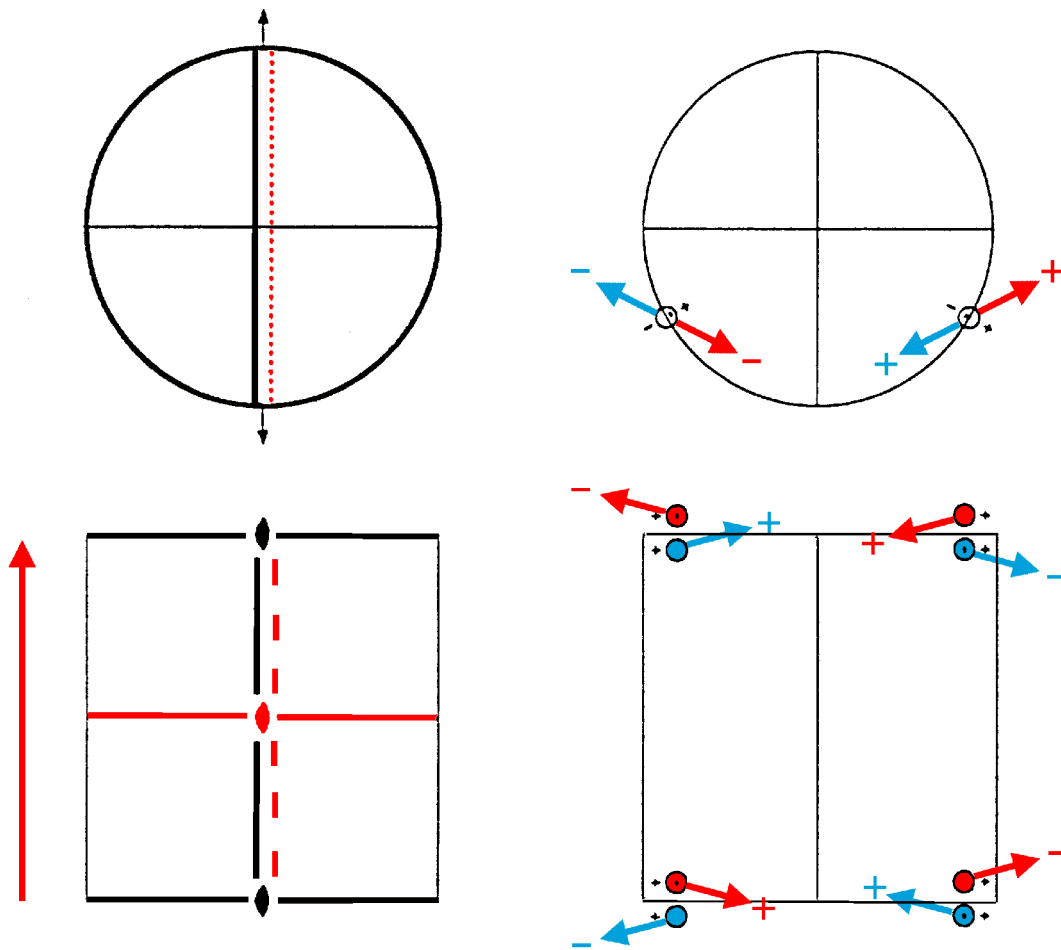
$p_{2c}2mm$

No. 18.7.88

$2mm1'$

$p_{2c}2mm$

Orthorhombic



Origin on $2mm$

Asymmetric unit $0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) 2_x $x,0,0$	(3) m $x,y,0$	(4) m $x,0,z$
$(1 0,0,0)$	$(2_x 0,0,0)$	$(m_z 0,0,0)$	$(m_y 0,0,0)$

For $(0,0,1)'$ + set

(1) t' $(0,0,1)$	(2) $2'_x$ $x,0,1/2$	(3) m' $x,y,1/2$	(4) c' $(0,0,1)$ $x,0,z$
$(1 0,0,1)'$	$(2'_x 0,0,1)'$	$(m'_z 0,0,1)'$	$(m'_y 0,0,1)'$

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		$(0,0,0)_+$	$(0,0,1)'$ +	
4 f 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$	(3) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(4) $x,\bar{y},z [\bar{u},v,\bar{w}]$
2 e .m	$x,0,z [0,v,0]$	$x,0,\bar{z} [0,\bar{v},0]$		
2 d ..m'	$x,y,1/2 [u,v,0]$	$x,\bar{y},1/2 [\bar{u},v,0]$		
2 c ..m	$x,y,0 [0,0,w]$	$x,\bar{y},0 [0,0,\bar{w}]$		
1 b 2'mm'	$x,0,1/2 [0,v,0]$			
1 a 2mm	$x,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $11m1'$	Along [100] $p_{2a^*}2mm$	Along [010] $p1m11'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $0,y,0$

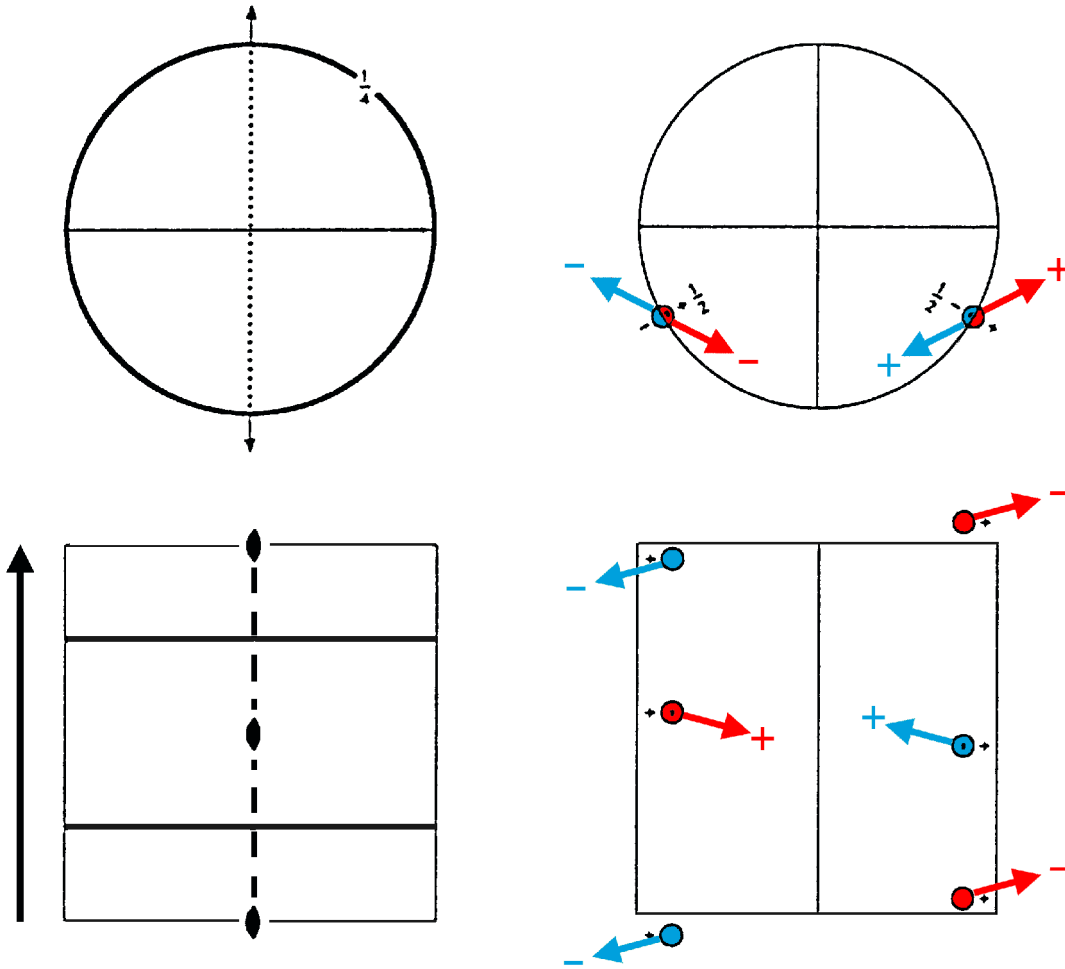
$p2cm$

$2mm$

Orthorhombic

No. 19.1.89

$p2cm$



Origin on $2c1$

Asymmetric unit $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--------------------|----------------------------------|--|--------------------------------------|
| (1) 1
(1 0,0,0) | (2) 2 $x,0,0$
(2_x 0,0,0) | (3) c $(0,0,1/2)$ $x,0,z$
(m_y 0,0,1/2) | (4) m $x,y,1/4$
(m_z 0,0,1/2) |
|--------------------|----------------------------------|--|--------------------------------------|

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
4 c 1	(3) $x,\bar{y},z+1/2$ [\bar{u} ,v, \bar{w}]	(4) $x,y,\bar{z}+1/2$ [\bar{u} , \bar{v} ,w]
2 b ..m	$x,y,1/4$ [0,0,w]	$x,\bar{y},3/4$ [0,0, \bar{w}]
2 a 2..	$x,0,0$ [u,0,0]	$x,0,1/2$ [\bar{u} ,0,0]

Symmetry of special projections

Along [001] $11m1'$	Along [100] $p2mg$ $a^* = c$	Along [010] $p_{2a^*}1m1$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

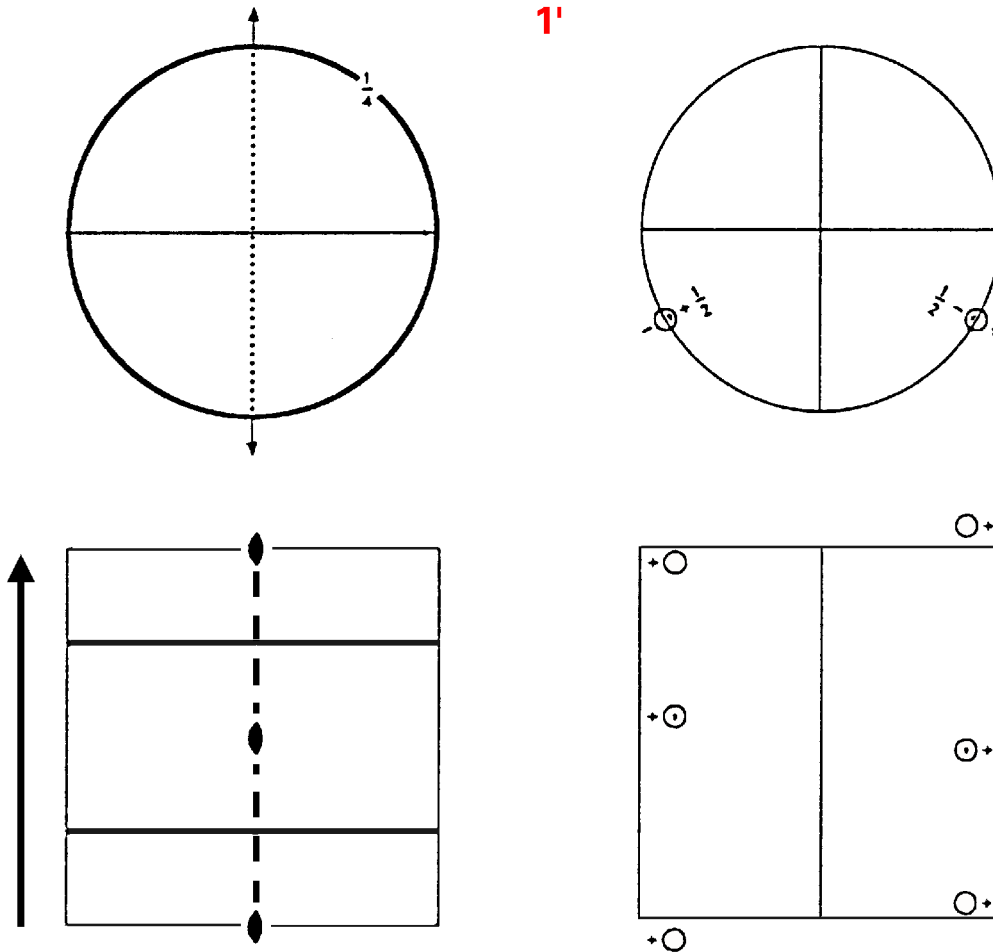
$p2cm1'$

No. 19.2.90

$2mm1'$

$p2cm1'$

Orthorhombic



Origin on $2c11'$

Asymmetric unit $0 \leq z \leq 1/4$

Symmetry operations

For 1 + set

(1) 1	(2) $2 \ x,0,0$	(3) $c \ (0,0,1/2) \ x,0,z$	(4) $m \ x,y,1/4$
(1 0,0,0)	(2_x 0,0,0)	(m_y 0,0,1/2)	(m_z 0,0,1/2)

For 1' + set

(1) 1'	(2) $2' \ x,0,0$	(3) $c' \ (0,0,1/2) \ x,0,z$	(4) $m' \ x,y,1/4$
(1 0,0,0)'	(2_x 0,0,0)'	(m_y 0,0,1/2)'	(m_z 0,0,1/2)'

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

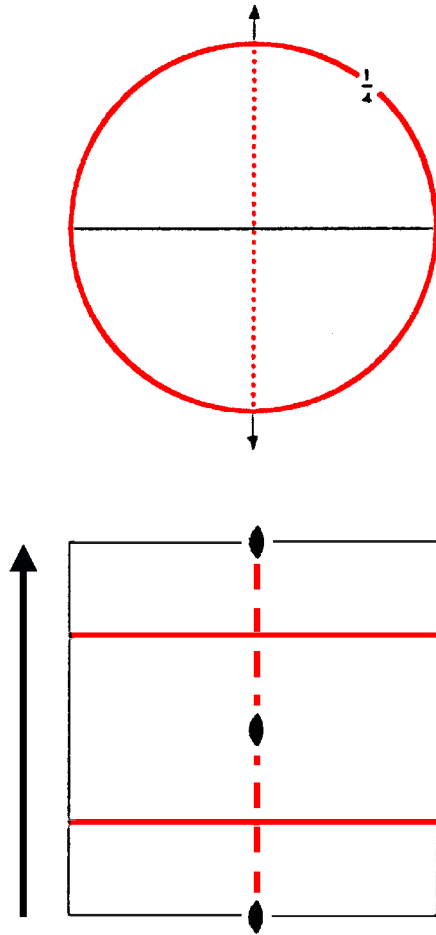
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		1+ 1' +
4 c 11'	(1) x,y,z [0,0,0]	(2) x,\bar{y},\bar{z} [0,0,0]
	(3) $x,\bar{y},z+1/2$ [0,0,0]	(4) $x,y,\bar{z}+1/2$ [0,0,0]
2 b ..m1'	$x,y,1/4$ [0,0,0]	$x,\bar{y},3/4$ [0,0,0]
2 a 2..1'	$x,0,0$ [0,0,0]	$x,0,1/2$ [0,0,0]

Symmetry of special projections

Along [001] $11m1'$	Along [100] $p2mg1'$	Along [010] $p1m11'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c/2$ Origin at 0,y,0

$p2c'm'$

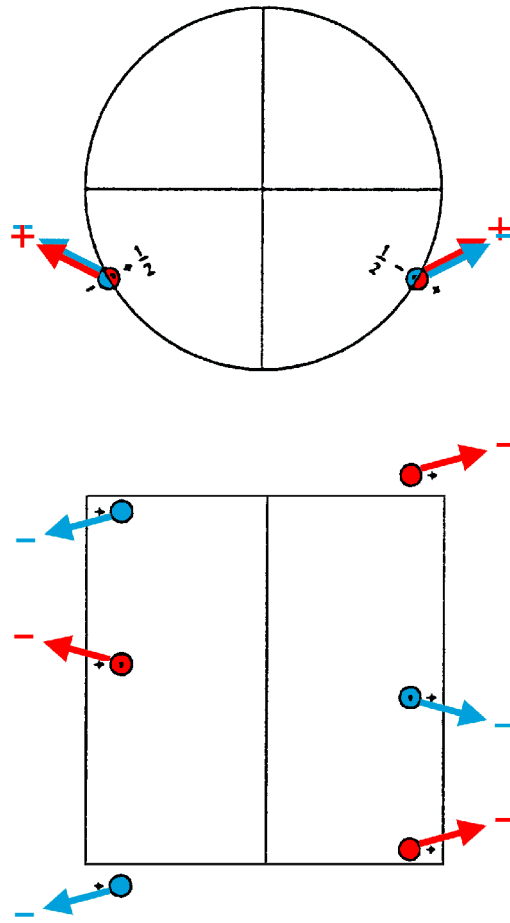
No. 19.3.91



$2m'm'$

$p2c'm'$

Orthorhombic



Origin on $2c'$

Asymmetric unit $0 \leq z \leq 1/4$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2_x x,0,0
(2_x |0,0,0)
- (3) c' (0,0,1/2) x,0,z
(m_y |0,0,1/2)'
- (4) m' x,y,1/4
(m_z |0,0,1/2)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 c 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
	(3) $x,\bar{y},z+1/2$ [u, \bar{v} ,w]	(4) $x,y,\bar{z}+1/2$ [u,v, \bar{w}]
2 b ..m'	$x,y,1/4$ [u,v,0]	$x,\bar{y},3/4$ [u, \bar{v} ,0]
2 a 2..	$x,0,0$ [u,0,0]	$x,0,1/2$ [u,0,0]

Symmetry of special projections

Along [001] $11m'$	Along [100] $p2m'g'$	Along [010] $p1m'1$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at 0,y,0

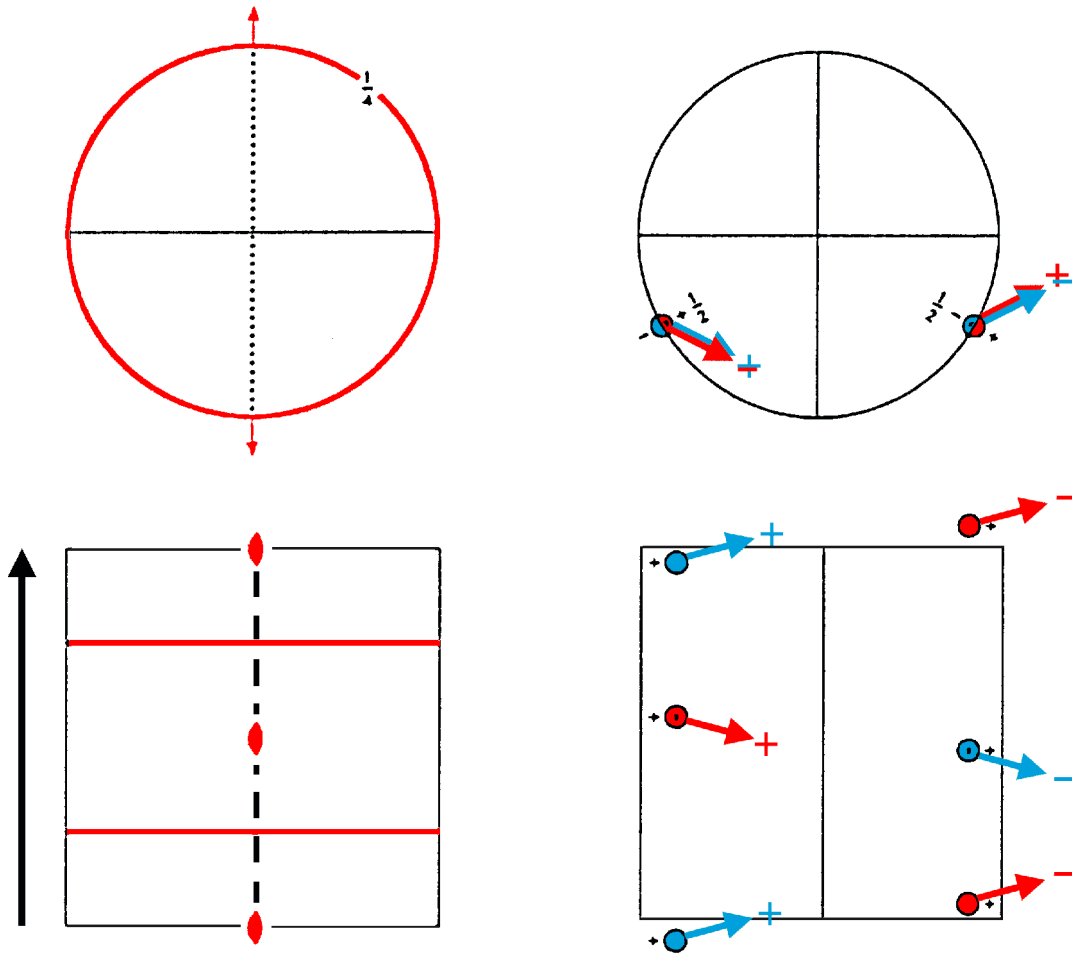
$p2'cm'$

No. 19.4.92

$2'mm'$

$p2'cm'$

Orthorhombic



Origin on $2'c1$

Asymmetric unit $0 \leq z \leq 1/4$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) $2'$ $x,0,0$
(2_x |0,0,0)'
- (3) c $(0,0,1/2)$ $x,0,z$
(m_y |0,0,1/2)
- (4) m' $x,y,1/4$
(m_z |0,0,1/2)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 c 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]
	(3) $x,\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	(4) $x,y,\bar{z}+1/2$ [u,v, \bar{w}]
	2 b ..m'	$x,y,1/4$ [u,v,0] $x,\bar{y},3/4$ [$\bar{u},v,0$]
	2 a 2'..	$x,0,0$ [0,v,w] $x,0,1/2$ [0,v, \bar{w}]

Symmetry of special projections

Along [001] $11m$	Along [100] $p2'm'g$ $a^* = c$	Along [010] $p_{2a^*}1m1$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

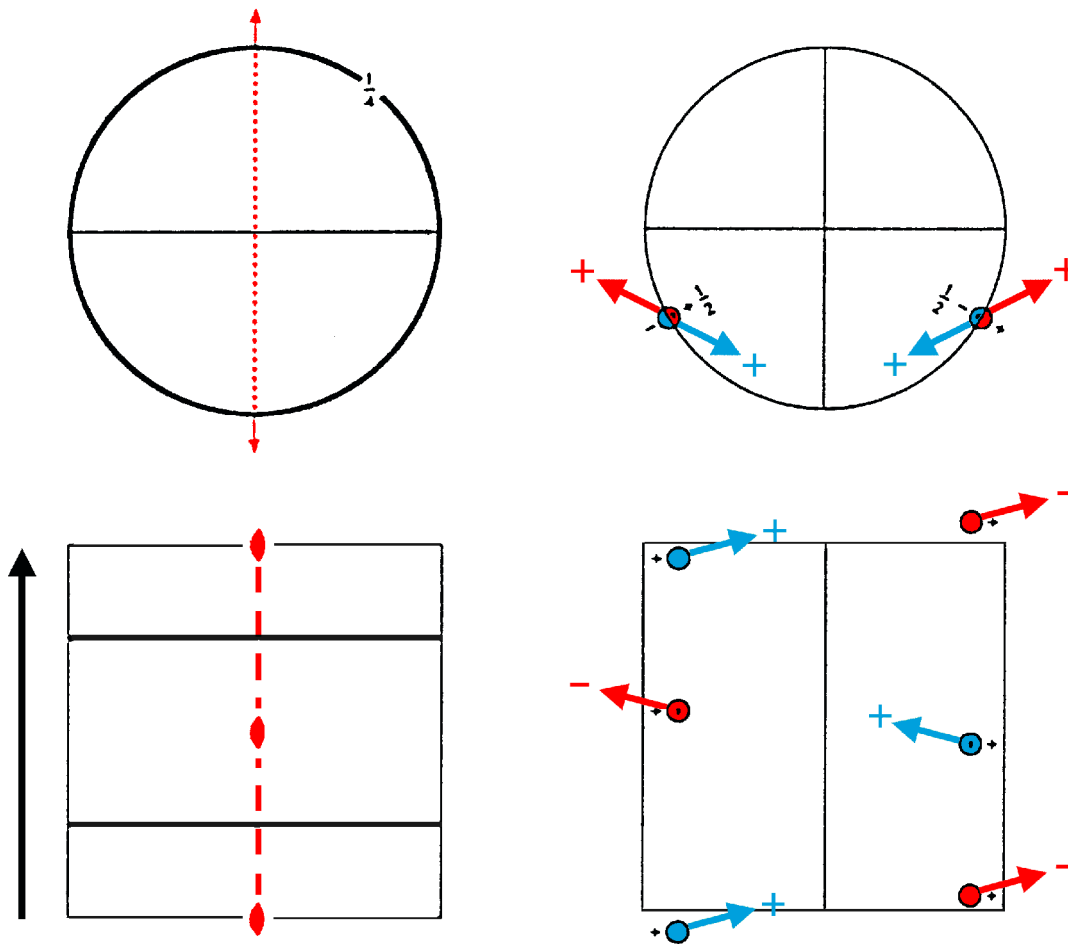
$p2'c'm$

No. 19.5.93

$2'm'm$

$p2'c'm$

Orthorhombic



Origin on $2'c'1$

Asymmetric unit $0 \leq z \leq 1/4$

Symmetry operations

- (1) 1 (1|0,0,0) (2) $2'$ $x,0,0$ ($2_x|0,0,0$)' (3) c' $(0,0,1/2)$ $x,0,z$ ($m_y|0,0,1/2$)' (4) m $x,y,1/4$ ($m_z|0,0,1/2$)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u} ,v,w]
4 c 1	(3) $x,\bar{y},z+1/2$ [u, \bar{v} ,w]	(4) $x,y,\bar{z}+1/2$ [\bar{u} , \bar{v} ,w]
2 b ..m	$x,y,1/4$ [0,0,w]	$x,\bar{y},3/4$ [0,0,w]
2 a 2'..	$x,0,0$ [0,v,w]	$x,0,1/2$ [0, \bar{v} ,w]

Symmetry of special projections

Along [001] $11m'$ Origin at 0,0,z	Along [100] $p2'mg'$ $a^* = c$ Origin at x,0,0	Along [010] $p_{2a^*}1m1$ $a^* = c/2$ Origin at 0,y,0
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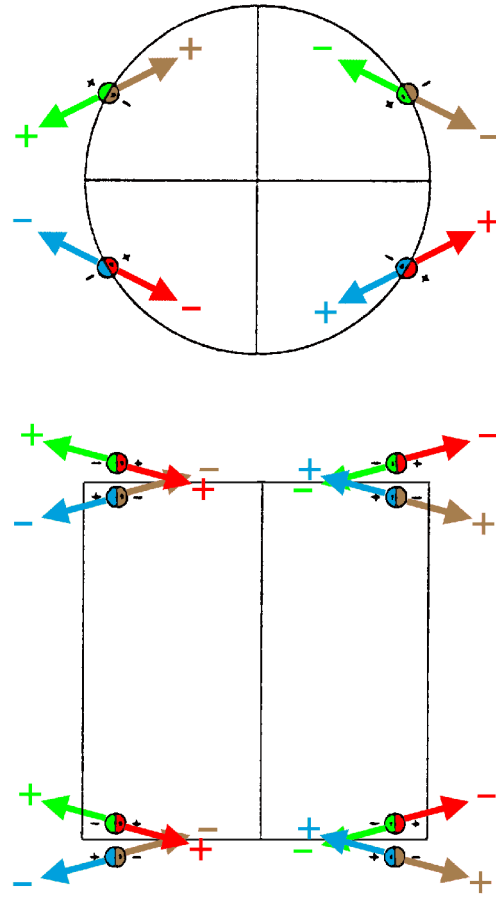
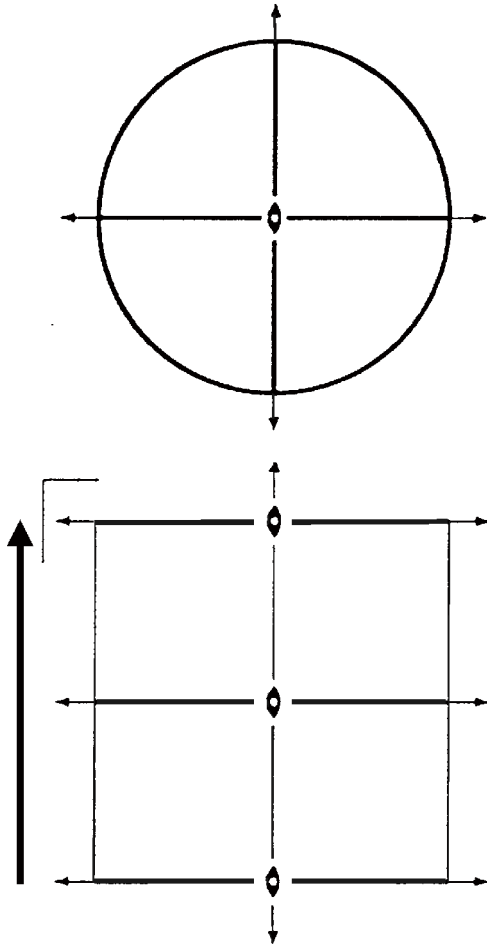
$pmmm$

No. 20.1.94

mmm

$p2/m2/m2/m$

Orthorhombic



Origin at center (mmm)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,0,z$
(2_z |0,0,0)

(3) 2 $0,y,0$
(2_y |0,0,0)

(4) 2 $x,0,0$
(2_x |0,0,0)

(5) $\bar{1}$ $0,0,0$
($\bar{1}$ |0,0,0)

(6) m $x,y,0$
(m_z |0,0,0)

(7) m $x,0,z$
(m_y |0,0,0)

(8) m $0,y,z$
(m_x |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 l 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 k ..m	$x,y,1/2 [0,0,w]$	$\bar{x},\bar{y},1/2 [0,0,w]$	$\bar{x},y,1/2 [0,0,\bar{w}]$	$x,\bar{y},1/2 [0,0,\bar{w}]$
4 j ..m	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{x},y,0 [0,0,\bar{w}]$	$x,\bar{y},0 [0,0,\bar{w}]$
4 i .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$	$\bar{x},0,\bar{z} [0,v,0]$	$x,0,\bar{z} [0,\bar{v},0]$
4 h m..	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$	$0,y,\bar{z} [\bar{u},0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
2 g mm2	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
2 f m2m	$0,y,1/2 [0,0,0]$	$0,\bar{y},1/2 [0,0,0]$		
2 e m2m	$0,y,0 [0,0,0]$	$0,\bar{y},0 [0,0,0]$		
2 d 2mm	$x,0,1/2 [0,0,0]$	$\bar{x},0,1/2 [0,0,0]$		
2 c 2mm	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$		
1 b mmm	$0,0,1/2 [0,0,0]$			
1 a mmm	$0,0,0 [0,0,0]$			

Continued

No. 20.1.94

$pmmm$

Symmetry of special projections

Along $[001]$ $2mm1'$

Origin at $0,0,z$

Along $[100]$ $p2mm1'$

$a^* = c$

Origin at $x,0,0$

Along $[010]$ $p2mm1'$

$a^* = c$

Origin at $0,y,0$

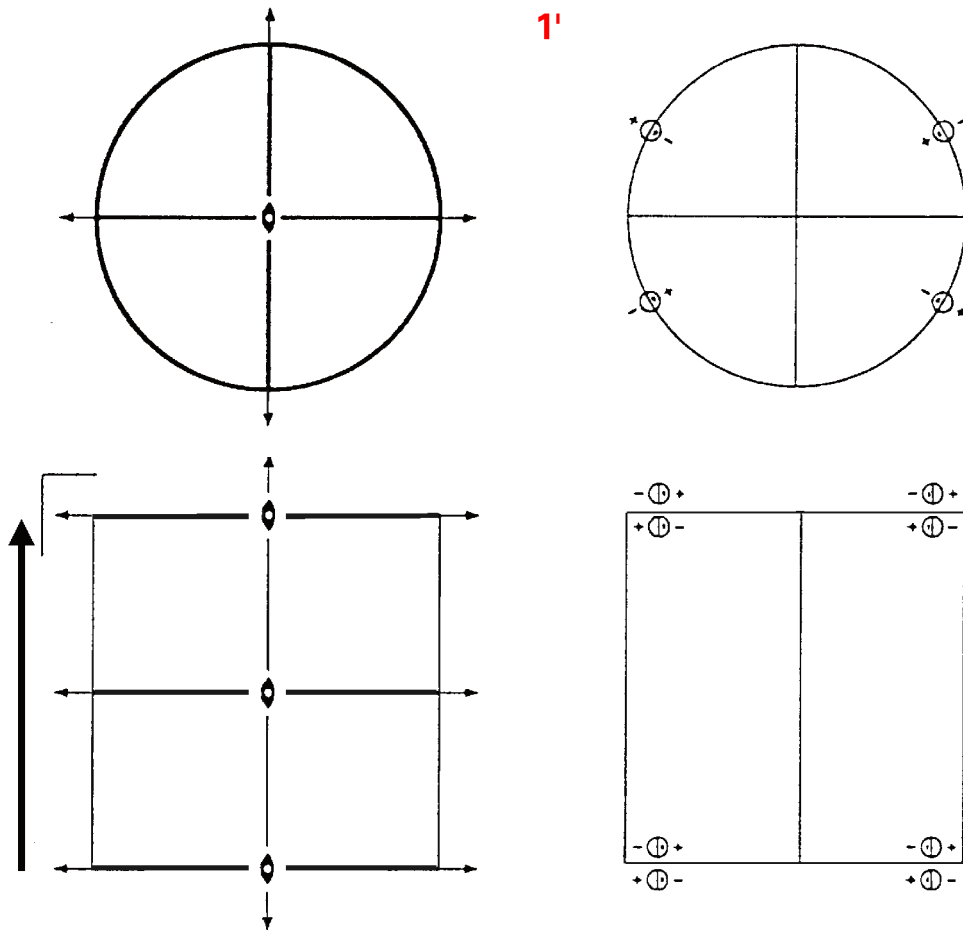
$pmmm1'$

$mmm1'$

Orthorhombic

No. 20.2.95

$p2/m2/m2/m1'$



Origin at center ($mmm1'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For 1 + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) m x,0,z
(m _y 0,0,0) | (8) m 0,y,z
(m _x 0,0,0) |

For 1' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 2' 0,y,0
(2 _y 0,0,0)' | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) m' x,y,0
(m _z 0,0,0)' | (7) m' x,0,z
(m _y 0,0,0)' | (8) m' 0,y,z
(m _x 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1'	+	
8 l 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]	(3) \bar{x},y,\bar{z} [0,0,0]	(4) x, \bar{y},\bar{z} [0,0,0]
	(5) \bar{x},\bar{y},\bar{z} [0,0,0]	(6) x,y, \bar{z} [0,0,0]	(7) x, \bar{y},z [0,0,0]	(8) \bar{x},y,z [0,0,0]
4 k ..m1'	x,y,1/2 [0,0,0]	$\bar{x},\bar{y},1/2$ [0,0,0]	$\bar{x},y,1/2$ [0,0,0]	x, $\bar{y},1/2$ [0,0,0]
4 j ..m1'	x,y,0 [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]	$\bar{x},y,0$ [0,0,0]	x, $\bar{y},0$ [0,0,0]
4 i .m.1'	x,0,z [0,0,0]	$\bar{x},0,z$ [0,0,0]	$\bar{x},0,\bar{z}$ [0,0,0]	x,0, \bar{z} [0,0,0]
4 h m..1'	0,y,z [0,0,0]	0, \bar{y},z [0,0,0]	0,y, \bar{z} [0,0,0]	0, \bar{y},\bar{z} [0,0,0]
2 g mm21'	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]		
2 f m2m1'	0,y,1/2 [0,0,0]	0, $\bar{y},1/2$ [0,0,0]		
2 e m2m1'	0,y,0 [0,0,0]	0, $\bar{y},0$ [0,0,0]		
2 d 2mm1'	x,0,1/2 [0,0,0]	$\bar{x},0,1/2$ [0,0,0]		
2 c 2mm1'	x,0,0 [0,0,0]	$\bar{x},0,0$ [0,0,0]		
1 b mmm1'	0,0,1/2 [0,0,0]			
1 a mmm1'	0,0,0 [0,0,0]			

Continued

No. 20.2.95

$pmmm1'$

Symmetry of special projections

Along $[001]$ $2mm1'$

Origin at $0,0,z$

Along $[100]$ $p2mm1'$

$a^* = c$

Origin at $x,0,0$

Along $[010]$ $p2mm1'$

$a^* = c$

Origin at $0,y,0$

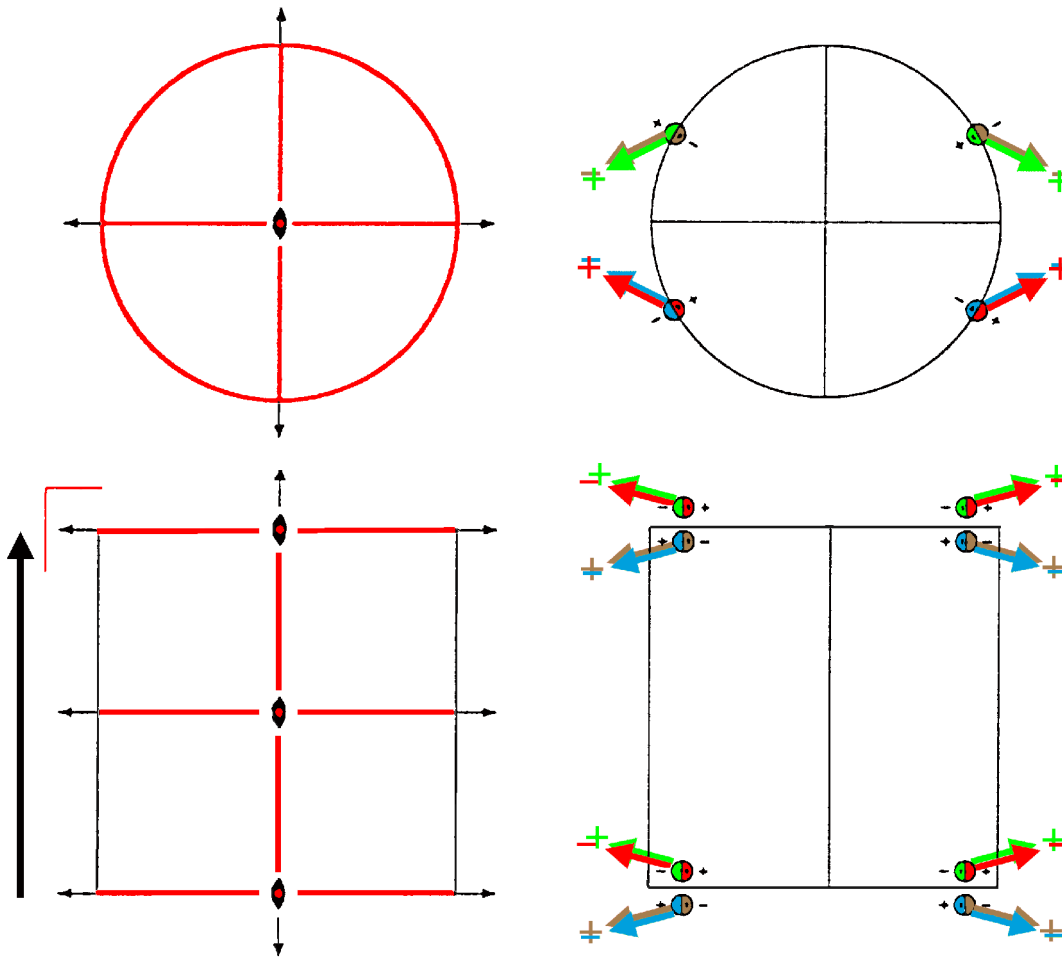
$pm'm'm'$

No. 20.3.96

$m'm'm'$

$p2/m'2/m'2/m'$

Orthorhombic



Origin at center ($m'm'm'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 2 0,y,0
(2_y|0,0,0)

(4) 2 x,0,0
(2_x|0,0,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m' x,y,0
(m'_z |0,0,0)

(7) m' x,0,z
(m'_y |0,0,0)

(8) m' 0,y,z
(m'_x |0,0,0)

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]
8 l 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y, \bar{z} [u,v, \bar{w}]	(7) x, \bar{y},z [u, \bar{v},w]	(8) \bar{x},y,z [\bar{u},v,w]
4 k ..m'	x,y,1/2 [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]	$\bar{x},y,1/2$ [$\bar{u},v,0$]	x, $\bar{y},1/2$ [u, $\bar{v},0$]
4 j ..m'	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{x},y,0$ [$\bar{u},v,0$]	x, $\bar{y},0$ [u, $\bar{v},0$]
4 i .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,0, \bar{z} [u,0, \bar{w}]
4 h m'..	0,y,z [0,v,w]	0, \bar{y},z [0, \bar{v},w]	0,y, \bar{z} [0,v, \bar{w}]	0, \bar{y},\bar{z} [0, \bar{v},\bar{w}]
2 g m'm'2	0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]		
2 f m'2m'	0,y,1/2 [0,v,0]	0, $\bar{y},1/2$ [0, $\bar{v},0$]		
2 e m'2m'	0,y,0 [0,v,0]	0, $\bar{y},0$ [0, $\bar{v},0$]		
2 d 2m'm'	x,0,1/2 [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]		
2 c 2m'm'	x,0,0 [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]		
1 b m'm'm'	0,0,1/2 [0,0,0]			
1 a m'm'm'	0,0,0 [0,0,0]			

Continued

No. 20.3.96

$pm'm'm'$

Symmetry of special projections

Along $[001]$ $2m'm'$

Origin at $0,0,z$

Along $[100]$ $p2m'm'$

$a^* = c$

Origin at $x,0,0$

Along $[010]$ $p2m'm'$

$a^* = c$

Origin at $0,y,0$

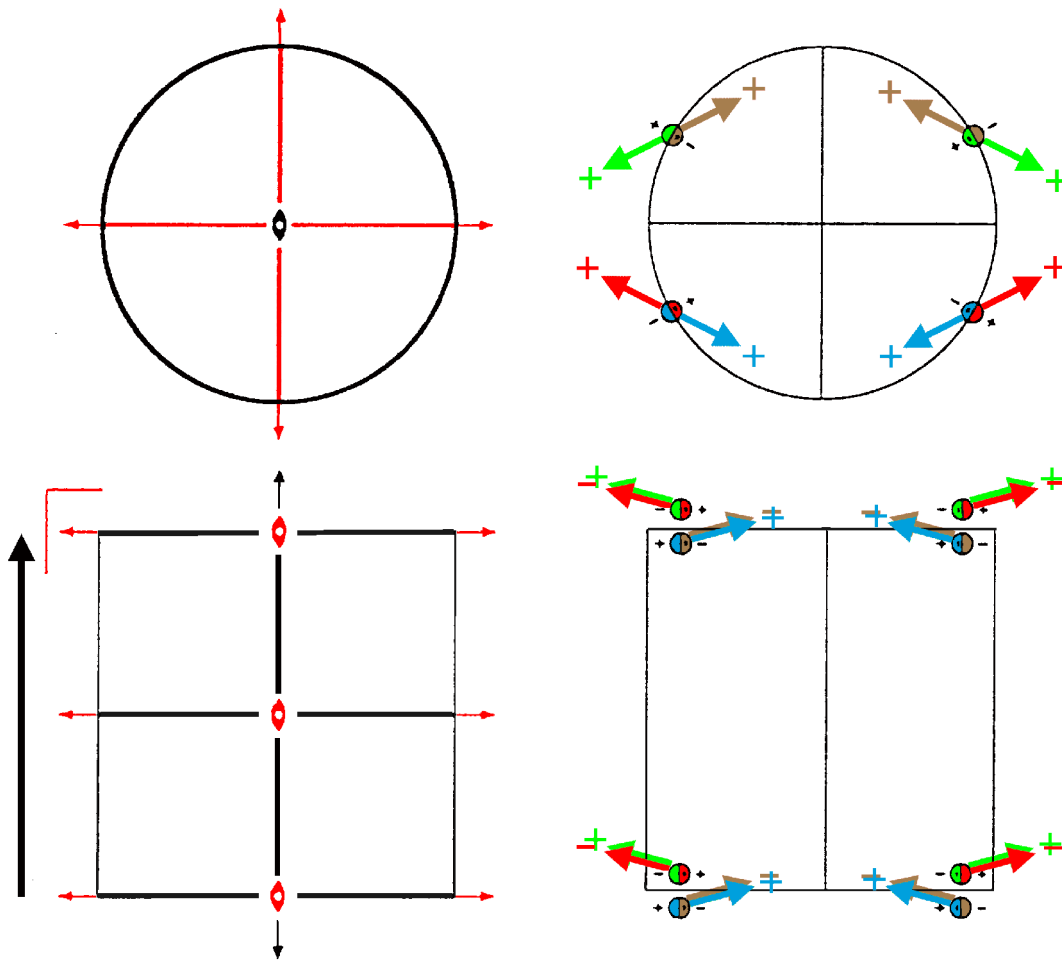
$pm'm'm$

$m'm'm'm$

Orthorhombic

No. 20.4.97

$p2'm'2'/m'2'/m$



Origin at center ($m'm'm'm$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 2' _y 0,y,0
(2' _y 0,0,0)' | (4) 2' _x x,0,0
(2' _x 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m _x x,y,0
(m _x 0,0,0) | (7) m' _x x,0,z
(m' _x 0,0,0)' | (8) m' _y 0,y,z
(m' _y 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
8 l 1	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x},y,z [\bar{u},v,w]$
4 k ..m	$x,y,1/2 [0,0,w]$	$\bar{x},\bar{y},1/2 [0,0,w]$	$\bar{x},y,1/2 [0,0,w]$	$x,\bar{y},1/2 [0,0,w]$
4 j ..m	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{x},y,0 [0,0,w]$	$x,\bar{y},0 [0,0,w]$
4 i .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$	$\bar{x},0,\bar{z} [u,0,w]$	$x,0,\bar{z} [\bar{u},0,w]$
4 h m'..	$0,y,z [0,v,w]$	$0,\bar{y},z [0,\bar{v},w]$	$0,y,\bar{z} [0,\bar{v},w]$	$0,\bar{y},\bar{z} [0,v,w]$
2 g m'm'2	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$		
2 f m'2'm	$0,y,1/2 [0,0,w]$	$0,\bar{y},1/2 [0,0,w]$		
2 e m'2'm	$0,y,0 [0,0,w]$	$0,\bar{y},0 [0,0,w]$		
2 d 2'm'm	$x,0,1/2 [0,0,w]$	$\bar{x},0,1/2 [0,0,w]$		
2 c 2'm'm	$x,0,0 [0,0,w]$	$\bar{x},0,0 [0,0,w]$		
1 b m'm'm	$0,0,1/2 [0,0,w]$			
1 a m'm'm	$0,0,0 [0,0,w]$			

Continued

No. 20.4.97

$pm'm'm$

Symmetry of special projections

Along $[001]$ $2mm1'$

Origin at $0,0,z$

Along $[100]$ $p2m'm'$

$a^* = c$

Origin at $x,0,0$

Along $[010]$ $p2m'm'$

$a^* = c$

Origin at $0,y,0$

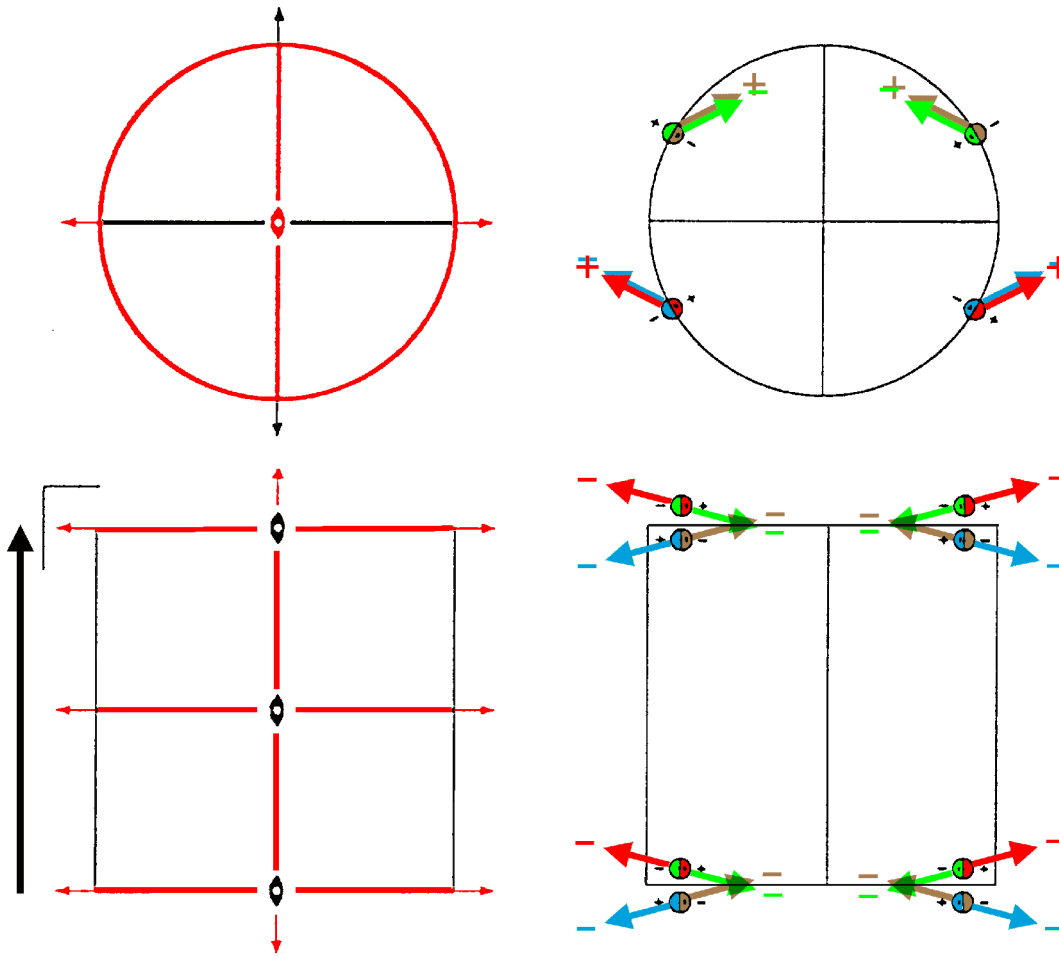
$pmm'm'$

No. 20.5.98

$mm'm'$

$p2/m2'/m'2'/m'$

Orthorhombic



Origin at center ($mm'm'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_z$ 0,0,z
(2_z |0,0,0)'

(3) $2'_y$ 0,y,0
(2_y |0,0,0)'

(4) 2_x x,0,0
(2_x |0,0,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m'_z x,y,0
(m_z |0,0,0)'

(7) m'_y x,0,z
(m_y |0,0,0)'

(8) m_x 0,y,z
(m_x |0,0,0)

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
8 l 1	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,y,\bar{z} [u,v,\bar{w}]$	(7) $x,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 k ..m'	$x,y,1/2 [u,v,0]$	$\bar{x},\bar{y},1/2 [u,v,0]$	$\bar{x},y,1/2 [u,\bar{v},0]$	$x,\bar{y},1/2 [u,\bar{v},0]$
4 j ..m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [u,v,0]$	$\bar{x},y,0 [u,\bar{v},0]$	$x,\bar{y},0 [u,\bar{v},0]$
4 i .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [u,0,\bar{w}]$	$\bar{x},0,\bar{z} [u,0,\bar{w}]$	$x,0,\bar{z} [u,0,w]$
4 h m..	$0,y,z [u,0,0]$	$0,\bar{y},z [u,0,0]$	$0,y,\bar{z} [u,0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
2 g mm'2'	$0,0,z [u,0,0]$	$0,0,\bar{z} [u,0,0]$		
2 f m2'm'	$0,y,1/2 [u,0,0]$	$0,\bar{y},1/2 [u,0,0]$		
2 e m2'm'	$0,y,0 [u,0,0]$	$0,\bar{y},0 [u,0,0]$		
2 d 2m'm'	$x,0,1/2 [u,0,0]$	$\bar{x},0,1/2 [u,0,0]$		
2 c 2m'm'	$x,0,0 [u,0,0]$	$\bar{x},0,0 [u,0,0]$		
1 b mm'm'	$0,0,1/2 [u,0,0]$			
1 a mm'm'	$0,0,0 [u,0,0]$			

Continued

No. 20.5.98

$pmm'm'$

Symmetry of special projections

Along $[001]$ $2'mm'$

Origin at $0,0,z$

Along $[100]$ $p2mm1'$

$a^* = c$

Origin at $x,0,0$

Along $[010]$ $p2'm'm$

$a^* = c$

Origin at $0,y,0$

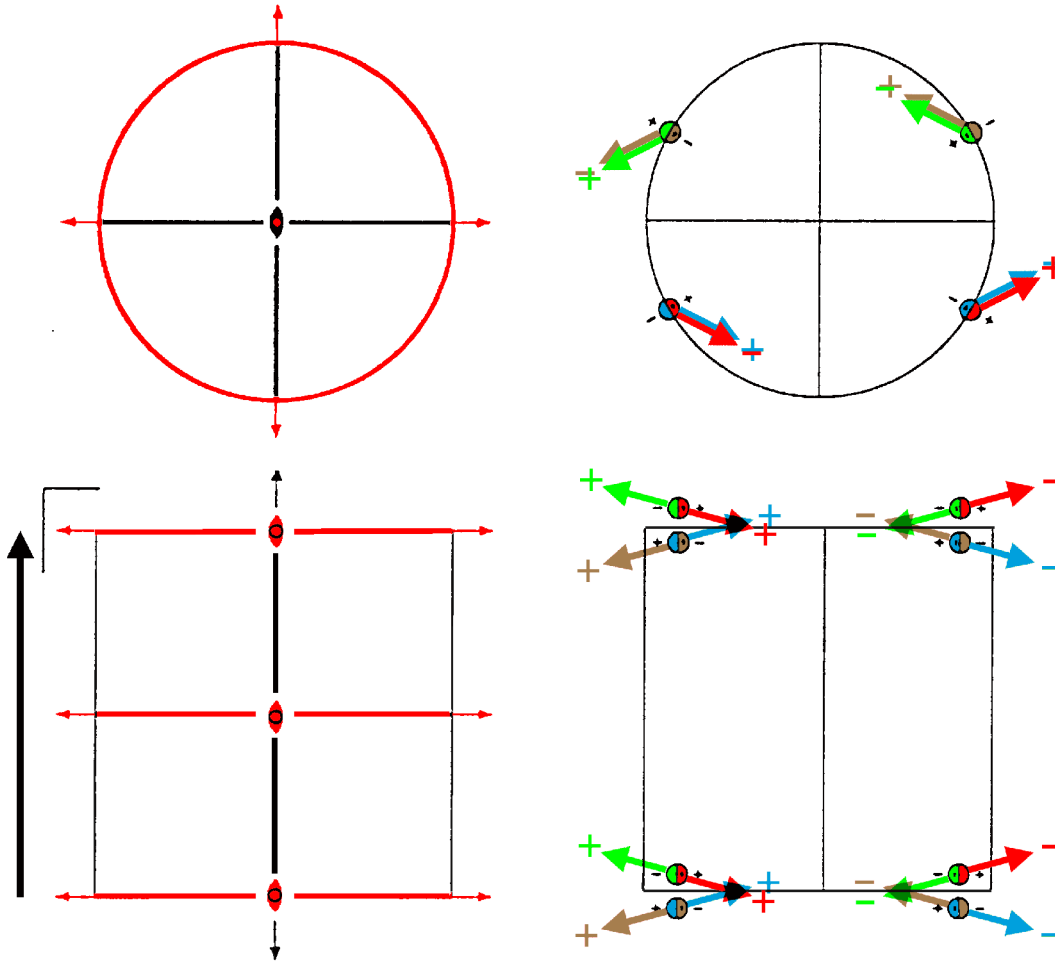
$pmmm'$

No. 20.6.99

mmm'

$p2'/m2'/m2'/m'$

Orthorhombic



Origin at center (mmm')

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|---|--------------------------------------|------------------------------------|------------------------------------|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 2' $0,y,0$
(2_y 0,0,0)' | (4) 2' $x,0,0$
(2_x 0,0,0)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (6) m' $x,y,0$
(m_z 0,0,0)' | (7) m $x,0,z$
(m_y 0,0,0) | (8) m $0,y,z$
(m_x 0,0,0) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [u, \bar{v},w]	(4) x,\bar{y},\bar{z} [\bar{u},v,w]
8 l 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [u,v, \bar{w}]	(7) x,\bar{y},z [\bar{u},v,\bar{w}]	(8) \bar{x},y,z [u, \bar{v},\bar{w}]
4 k ..m'	$x,y,1/2$ [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]	$\bar{x},y,1/2$ [u, $\bar{v},0$]	$x,\bar{y},1/2$ [$\bar{u},v,0$]
4 j ..m'	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{x},y,0$ [u, $\bar{v},0$]	$x,\bar{y},0$ [$\bar{u},v,0$]
4 i .m.	$x,0,z$ [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	$\bar{x},0,\bar{z}$ [0, $\bar{v},0$]	$x,0,\bar{z}$ [0,v,0]
4 h m..	$0,y,z$ [u,0,0]	$0,\bar{y},z$ [$\bar{u},0,0$]	$0,y,\bar{z}$ [u,0,0]	$0,\bar{y},\bar{z}$ [$\bar{u},0,0$]
2 g mm2	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]		
2 f m2'm'	$0,y,1/2$ [u,0,0]	$0,\bar{y},1/2$ [$\bar{u},0,0$]		
2 e m2'm'	$0,y,0$ [u,0,0]	$0,\bar{y},0$ [$\bar{u},0,0$]		
2 d 2'mm'	$x,0,1/2$ [0,v,0]	$\bar{x},0,1/2$ [0, $\bar{v},0$]		
2 c 2'mm'	$x,0,0$ [0,v,0]	$\bar{x},0,0$ [0, $\bar{v},0$]		
1 b mmm'	$0,0,1/2$ [0,0,0]			
1 a mmm'	$0,0,0$ [0,0,0]			

Continued

No. 20.6.99

$pmmm'$

Symmetry of special projections

Along $[001]$ $2mm$

Origin at $0,0,z$

Along $[100]$ $pm2mm1'$

$a^* = c$

Origin at $x,0,0$

Along $[010]$ $pm2mm1'$

$a^* = c$

Origin at $0,y,0$

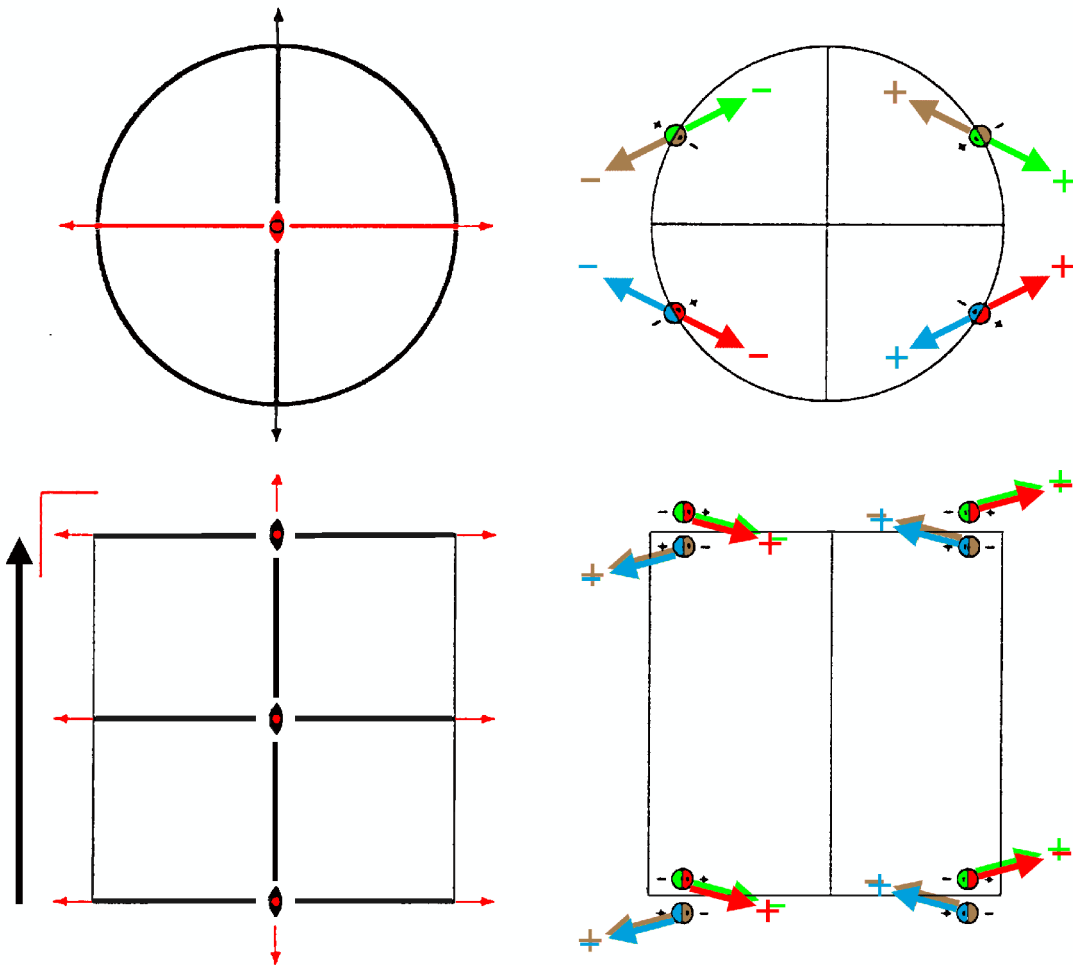
$pm'mm$

No. 20.7.100

$m'mm$

$p2/m'2'/m2'/m$

Orthorhombic



Origin at center ($m'mm$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|---|--------------------------------------|--------------------------------------|--------------------------------------|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,0,z
(2_z 0,0,0)' | (3) $2'_y$ 0,y,0
(2_y 0,0,0)' | (4) $2'_x$ x,0,0
(2_x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) m x,y,0
(m_z 0,0,0) | (7) m x,0,z
(m_y 0,0,0) | (8) m'_z 0,y,z
(m_x 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	(3) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(4) x,\bar{y},\bar{z} [u, \bar{v},\bar{w}]
8 l 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [\bar{u},\bar{v},w]	(7) x,\bar{y},z [\bar{u},v,\bar{w}]	(8) \bar{x},y,z [\bar{u},v,w]
4 k ..m	$x,y,1/2$ [0,0,w]	$\bar{x},\bar{y},1/2$ [0,0, \bar{w}]	$\bar{x},y,1/2$ [0,0,w]	$x,\bar{y},1/2$ [0,0, \bar{w}]
4 j ..m	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0, \bar{w}]	$\bar{x},y,0$ [0,0,w]	$x,\bar{y},0$ [0,0, \bar{w}]
4 i .m.	$x,0,z$ [0,v,0]	$\bar{x},0,z$ [0,v,0]	$\bar{x},0,\bar{z}$ [0, \bar{v} ,0]	$x,0,\bar{z}$ [0, \bar{v} ,0]
4 h m'..	$0,y,z$ [0,v,w]	$0,\bar{y},z$ [0,v, \bar{w}]	$0,y,\bar{z}$ [0, \bar{v} ,w]	$0,\bar{y},\bar{z}$ [0, \bar{v},\bar{w}]
2 g m'm2'	$0,0,z$ [0,v,0]	$0,0,\bar{z}$ [0, \bar{v} ,0]		
2 f m'2'm	$0,y,1/2$ [0,0,w]	$0,\bar{y},1/2$ [0,0, \bar{w}]		
2 e m'2'm	$0,y,0$ [0,0,w]	$0,\bar{y},0$ [0,0, \bar{w}]		
2 d 2mm	$x,0,1/2$ [0,0,0]	$\bar{x},0,1/2$ [0,0,0]		
2 c 2mm	$x,0,0$ [0,0,0]	$\bar{x},0,0$ [0,0,0]		
1 b m'mm	$0,0,1/2$ [0,0,0]			
1 a m'mm	$0,0,0$ [0,0,0]			

Continued

No. 20.7.100

$pm'mm$

Symmetry of special projections

Along $[001]$ $2mm1'$

Origin at $0,0,z$

Along $[100]$ $p2mm$

$a^* = c$

Origin at $x,0,0$

Along $[010]$ $p2mm1'$

$a^* = c$

Origin at $0,y,0$

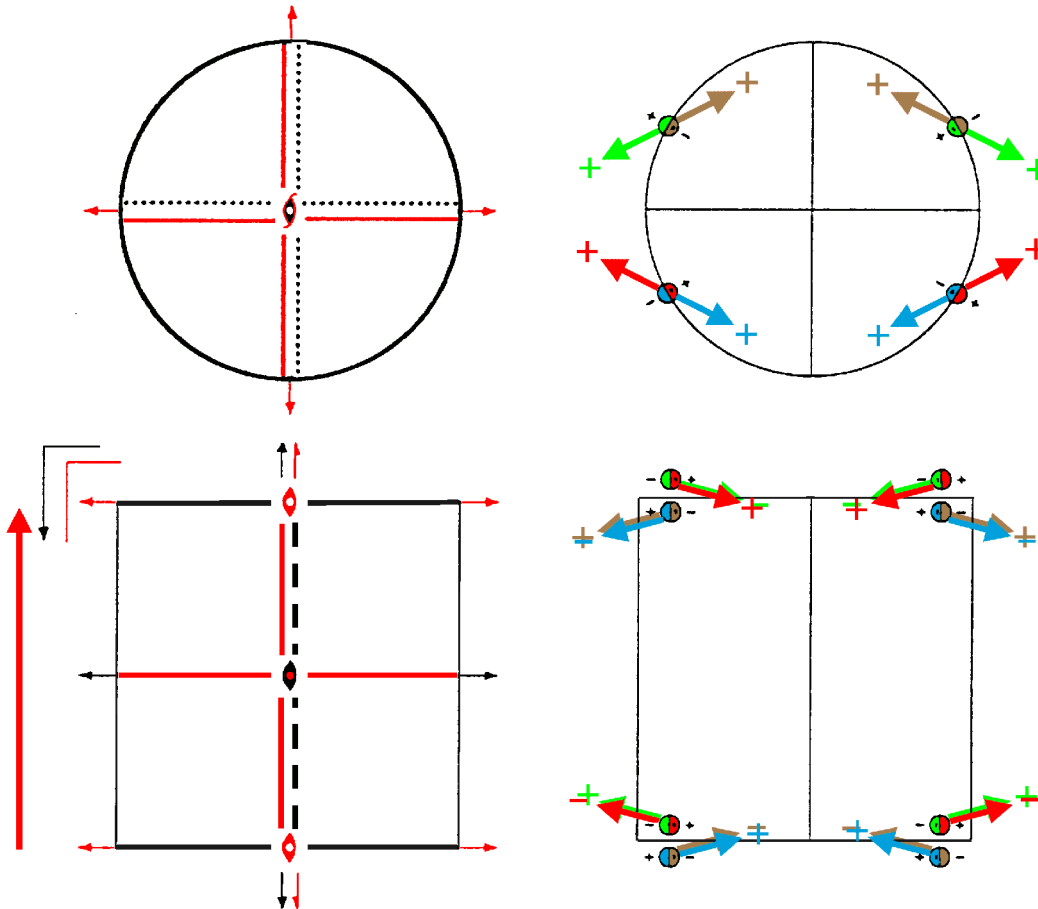
$p_{2c}m'm'm$

$mmm1'$

Orthorhombic

No. 20.8.101

$p_{2c}2'/m'2'/m'2'/m$



Origin at center ($m'm'm$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|----------------------------------|------------------------------------|------------------------------------|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 2' $0,y,0$
(2_y 0,0,0)' | (4) 2' $x,0,0$
(2_x 0,0,0)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m $x,y,0$
(m_z 0,0,0) | (7) m' $x,0,z$
(m_y 0,0,0)' | (8) m' $0,y,z$
(m_x 0,0,0)' |

For $(0,0,1)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' $(0,0,1)$
(1 0,0,1)' | (2) 2' $(0,0,1)$ $0,0,z$
(2_z 0,0,1)' | (3) 2 $0,y,1/2$
(2_y 0,0,1) | (4) 2 $x,0,1/2$
(2_x 0,0,1) |
| (5) $\bar{1}$ $0,0,1/2$
($\bar{1}$ 0,0,1)' | (6) m' $x,y,1/2$
(m_z 0,0,1)' | (7) c $(0,0,1)$ $x,0,z$
(m_y 0,0,1) | (8) c $(0,0,1)$ $0,y,z$
(m_x 0,0,1) |

Generators selected (1); t(0,0,1)' ; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(0,0,1)' +	
8 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [u, \bar{v},w]	(4) x, \bar{y},\bar{z} [\bar{u},v,w]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y, \bar{z} [\bar{u},\bar{v},w]	(7) x, \bar{y},z [u, \bar{v},w]	(8) \bar{x},y,z [\bar{u},v,w]
4 k ..m'	x,y,1/2 [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]	$\bar{x},y,1/2$ [u,v,0]	x, $\bar{y},1/2$ [$\bar{u},\bar{v},0$]
4 j ..m	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{x},y,0$ [0,0,w]	x, $\bar{y},0$ [0,0,w]
4 i .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [$\bar{u},0,w$]
4 h m'..	0,y,z [0,v,w]	0, \bar{y},z [0, \bar{v},w]	0,y, \bar{z} [0, \bar{v},w]	0, \bar{y},\bar{z} [0,v,w]
2 g m'm'2	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]		
2 f m'2m'	0,y,1/2 [0,v,0]	0, $\bar{y},1/2$ [0, $\bar{v},0$]		
2 e m'2'm	0,y,0 [0,0,w]	0, $\bar{y},0$ [0,0,w]		
2 d 2m'm'	x,0,1/2 [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]		
2 c 2'm'm	x,0,0 [0,0,w]	$\bar{x},0,0$ [0,0,w]		
1 b m'm'm'	0,0,1/2 [0,0,0]			
1 a m'm'm	0,0,0 [0,0,w]			

Continued

No. 20.8.101

p_{2c} m'm'm

Symmetry of special projections

Along [001] $2mm1'$

Origin at 0,0,z

Along [100] $p_{2a^*} 2m'm'$

$a^* = c$

Origin at x,0,1/2

Along [010] $p_{2a^*} 2m'm'$

$a^* = c$

Origin at 0,y,1/2

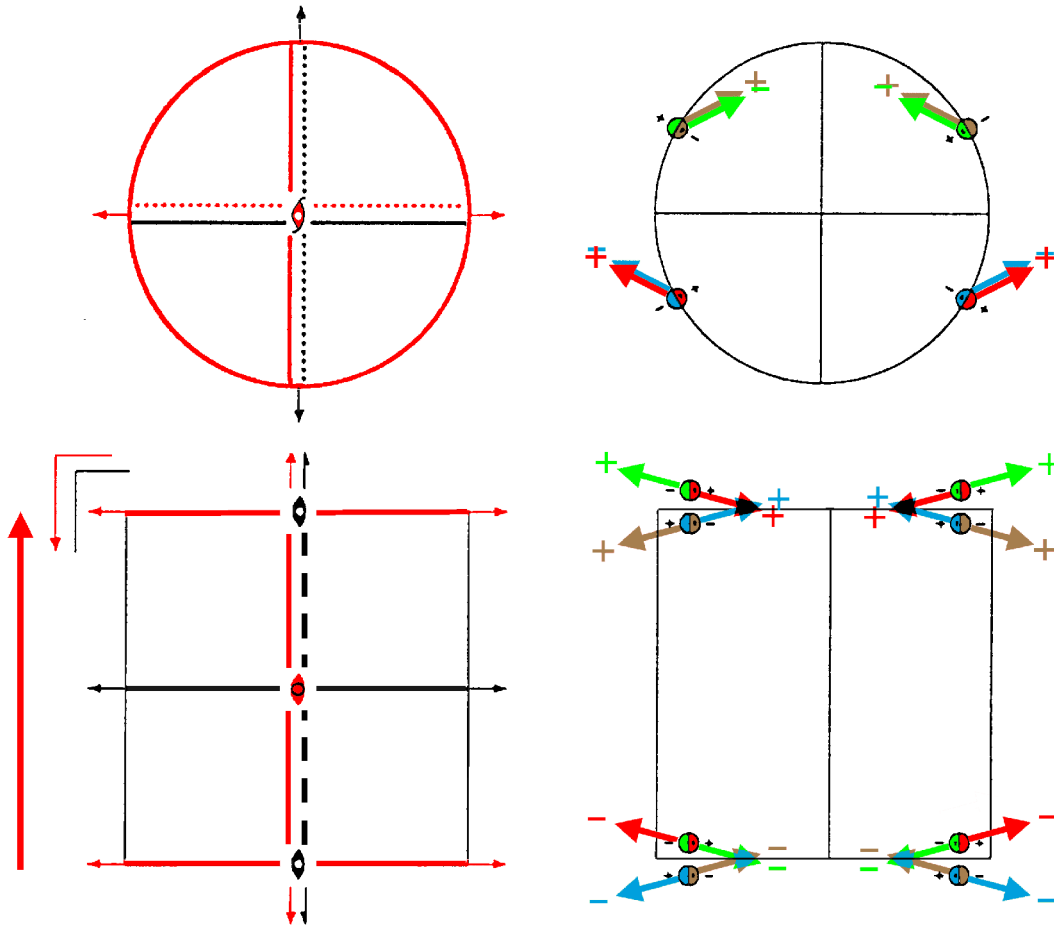
$p_{2c}mm'm'$

$mmm1'$

Orthorhombic

No. 20.9.102

$p_{2c}2/m2'/m'2'/m'$



Origin at center ($mm'm'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|---------------------------------------|---------------------------------------|--------------------------------------|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,0,z
($2'_z$ 0,0,0)' | (3) $2'_y$ 0,y,0
($2'_y$ 0,0,0)' | (4) $2'_x$ x,0,0
($2'_x$ 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m'_z x,y,0
(m'_z 0,0,0)' | (7) m'_y x,0,z
(m'_y 0,0,0)' | (8) m'_x 0,y,z
(m'_x 0,0,0) |

For $(0,0,1)'$ + set

- | | | | |
|--|--|---|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $2'_z$ (0,0,1) 0,0,z
($2'_z$ 0,0,1) | (3) $2'_y$ 0,y, $1/2$
($2'_y$ 0,0,1) | (4) $2'_x$ x,0, $1/2$
($2'_x$ 0,0,1)' |
| (5) $\bar{1}$ 0,0, $1/2$
($\bar{1}$ 0,0,1)' | (6) m'_z x,y, $1/2$
(m'_z 0,0,1) | (7) c (0,0,1) x,0,z
(m'_y 0,0,1) | (8) c' (0,0,1) 0,y,z
(m'_x 0,0,1)' |

Generators selected (1); t(0,0,1)' ; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	(0,0,0)+ (0,0,1)' +			
		(0,0,0)+	(0,0,1)'	(0,0,0)+	(0,0,1)'
8 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	(3) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y, \bar{z} [u,v, \bar{w}]	(7) x, \bar{y},z [u, \bar{v} ,w]	(8) \bar{x},y,z [u, \bar{v},\bar{w}]	
4 k ..m	x,y,1/2 [0,0,w]	$\bar{x},\bar{y},1/2$ [0,0, \bar{w}]	$\bar{x},y,1/2$ [0,0,w]	x, $\bar{y},1/2$ [0,0, \bar{w}]	
4 j ..m'	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [u,v,0]	$\bar{x},y,0$ [u, \bar{v} ,0]	x, $\bar{y},0$ [u, \bar{v} ,0]	
4 i .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [u,0, \bar{w}]	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [u,0, \bar{w}]	
4 h m..	0,y,z [u,0,0]	0, \bar{y},z [u,0,0]	0,y, \bar{z} [u,0,0]	0, \bar{y},\bar{z} [u,0,0]	
2 g mm'2'	0,0,z [u,0,0]	0,0, \bar{z} [u,0,0]			
2 f m2m	0,y,1/2 [0,0,0]	0, $\bar{y},1/2$ [0,0,0]			
2 e m2'm'	0,y,0 [u,0,0]	0, $\bar{y},0$ [u,0,0]			
2 d 2'm'm	x,0,1/2 [0,0,w]	$\bar{x},0,1/2$ [0,0, \bar{w}]			
2 c 2m'm'	x,0,0 [u,0,0]	$\bar{x},0,0$ [u,0,0]			
1 b mm'm	0,0,1/2 [0,0,0]				
1 a mm'm'	0,0,0 [u,0,0]				

Continued

No. 20.9.102

p_{2c} mm'm'

Symmetry of special projections

Along [001] $2'mm'$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

Along [010] $p_{2a^*}2mm$

$a^* = c$

Origin at 0,y,1/2

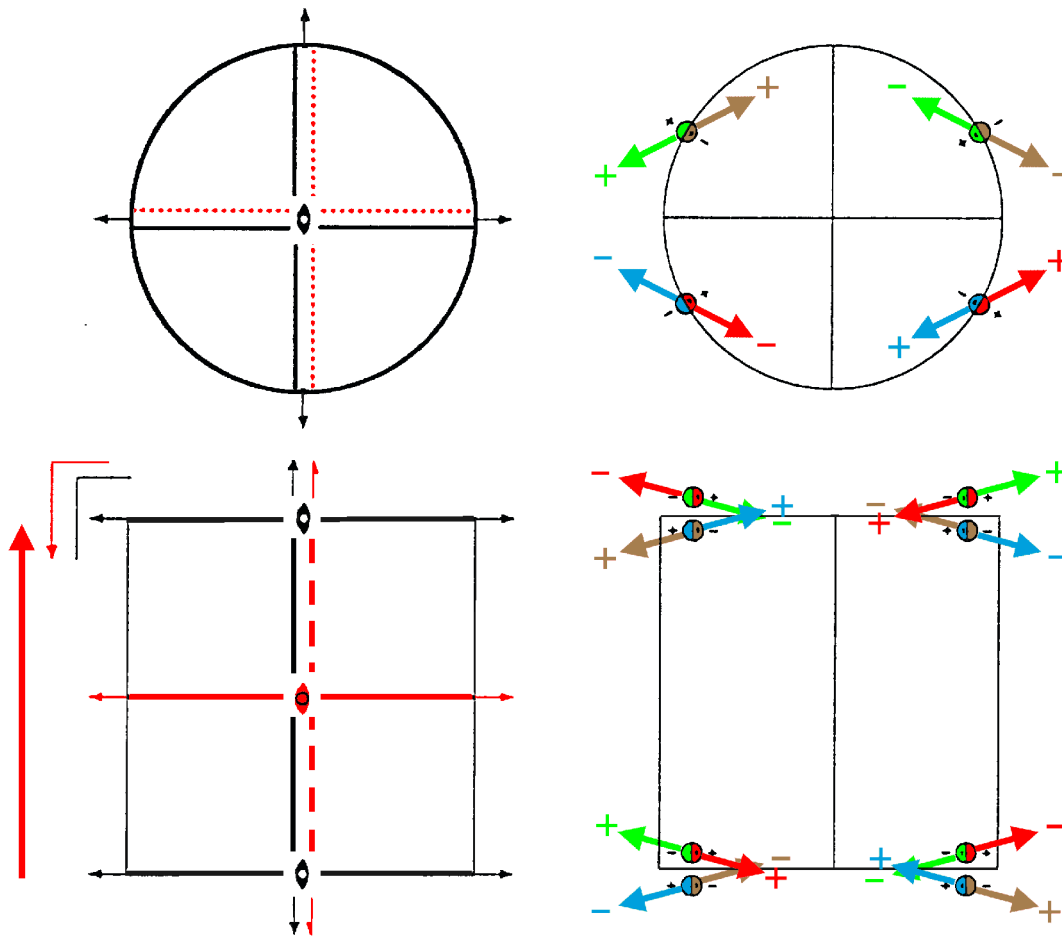
p_{2c} mmm

mmm1'

Orthorhombic

No. 20.10.103

$p_{2c}2/m2/m2/m$



Origin at center (mmm)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) m x,0,z
(m _y 0,0,0) | (8) m 0,y,z
(m _x 0,0,0) |

For (0,0,1)' + set

- | | | | |
|---|--|---|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2' (0,0,1) 0,0,z
(2 _z 0,0,1)' | (3) 2' 0,y,½
(2 _y 0,0,1)' | (4) 2' x,0,½
(2 _x 0,0,1)' |
| (5) $\bar{1}$ ' 0,0,½
($\bar{1}$ 0,0,1)' | (6) m' x,y,½
(m _z ' 0,0,1)' | (7) c' (0,0,1) x,0,z
(m _y ' 0,0,1)' | (8) c' (0,0,1) 0,y,z
(m _x ' 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(0,0,1)' +	
8 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y, \bar{z} [\bar{u},\bar{v},w]	(7) x, \bar{y},z [\bar{u},v,\bar{w}]	(8) \bar{x},y,z [u, \bar{v},\bar{w}]
4 k ..m'	x,y,1/2 [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]	$\bar{x},y,1/2$ [u, $\bar{v},0$]	x, $\bar{y},1/2$ [$\bar{u},v,0$]
4 j ..m	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{x},y,0$ [0,0, \bar{w}]	x, $\bar{y},0$ [0,0, \bar{w}]
4 i .m.	x,0,z [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	$\bar{x},0,\bar{z}$ [0,v,0]	x,0, \bar{z} [0, $\bar{v},0$]
4 h m..	0,y,z [u,0,0]	0, \bar{y},z [$\bar{u},0,0$]	0,y, \bar{z} [$\bar{u},0,0$]	0, \bar{y},\bar{z} [u,0,0]
2 g mm2	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]		
2 f m2'm'	0,y,1/2 [u,0,0]	0, $\bar{y},1/2$ [$\bar{u},0,0$]		
2 e m2m	0,y,0 [0,0,0]	0, $\bar{y},0$ [0,0,0]		
2 d 2'mm'	x,0,1/2 [0,v,0]	$\bar{x},0,1/2$ [0, $\bar{v},0$]		
2 c 2mm	x,0,0 [0,0,0]	$\bar{x},0,0$ [0,0,0]		
1 b mmm'	0,0,1/2 [0,0,0]			
1 a mmm	0,0,0 [0,0,0]			

Continued

No. 20.10.103

p_{2c} mmm

Symmetry of special projections

Along [001] $2mm1'$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

Along [010] $p2mm1'$

$a^* = c$

Origin at 0,y,0

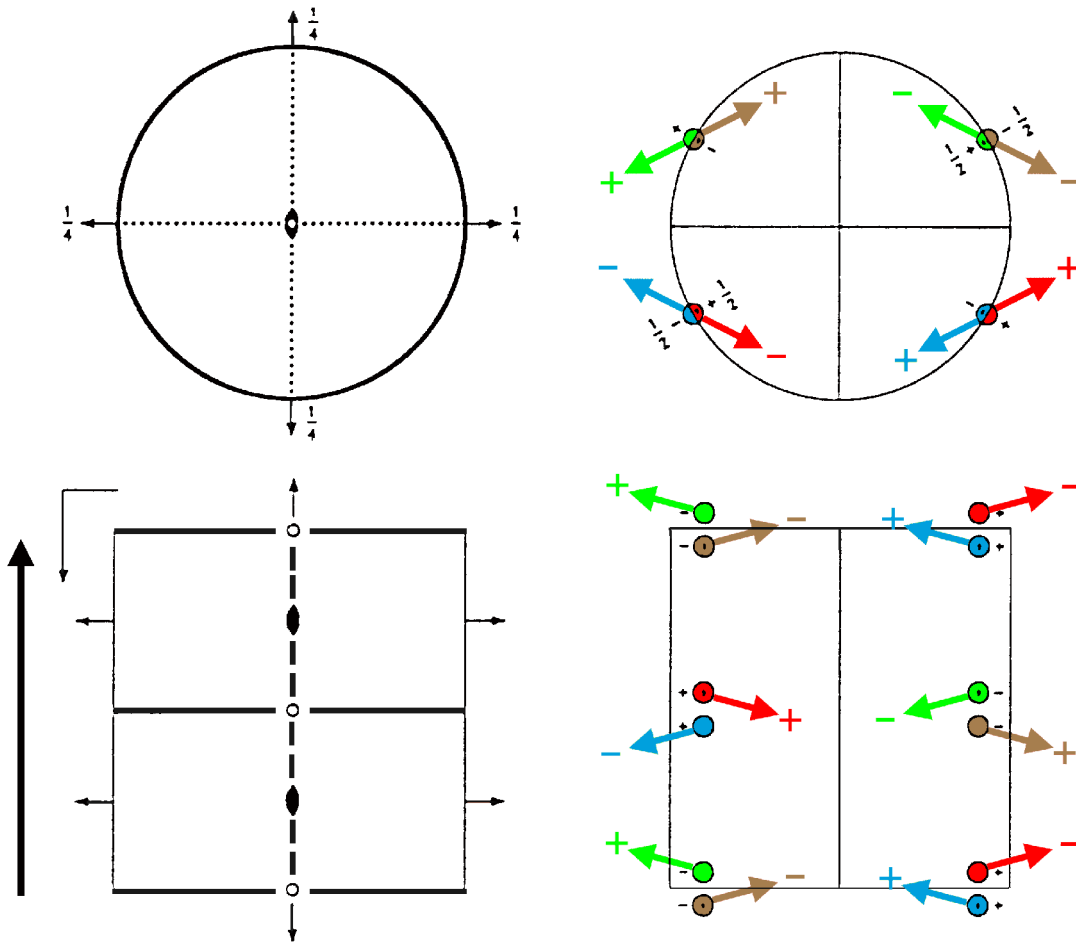
pccm

mmm

Orthorhombic

No. 21.1.104

$p2/c2/c2/m$



Origin at center (2/m) at cc2/m

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,1/4
(2 _y 0,0,1/2) | (4) 2 x,0,1/4
(2 _x 0,0,1/2) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) c (0,0,1/2) x,0,z
(m _y 0,0,1/2) | (8) c (0,0,1/2) 0,y,z
(m _x 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	(4) $x,\bar{y},\bar{z}+1/2$ [u,\bar{v},\bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y,\bar{z} [\bar{u},\bar{v},w]	
	(7) $x,\bar{y},z+1/2$ [$\bar{u},0,\bar{w}$]	(8) $\bar{x},y,z+1/2$ [u,\bar{v},\bar{w}]	
	4 f ..m	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]
		$\bar{x},y,1/2$ [0,0, \bar{w}]	$x,\bar{y},1/2$ [0,0, \bar{w}]
	4 e ..2	$0,0,z$ [0,0,w]	$0,0,\bar{z}+1/2$ [0,0, \bar{w}]
		$0,0,\bar{z}$ [0,0,w]	$0,0,z+1/2$ [0,0, \bar{w}]
4 d .2.	$0,y,1/4$ [0,v,0]	$0,\bar{y},1/4$ [0, \bar{v} ,0]	
	$0,\bar{y},3/4$ [0,v,0]	$0,y,3/4$ [0, \bar{v} ,0]	
4 c 2..	$x,0,1/4$ [u,0,0]	$\bar{x},0,1/4$ [$\bar{u},0,0$]	
	$\bar{x},0,3/4$ [u,0,0]	$x,0,3/4$ [$\bar{u},0,0$]	
2 b 222	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]	
2 a ..2/m	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0, \bar{w}]	

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p_{2a^*}2m'm'$ $a^* = c/2$	Along [010] $p_{2a^*}2m'm'$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,1/4	Origin at 0,y,1/4

$pccm1'$

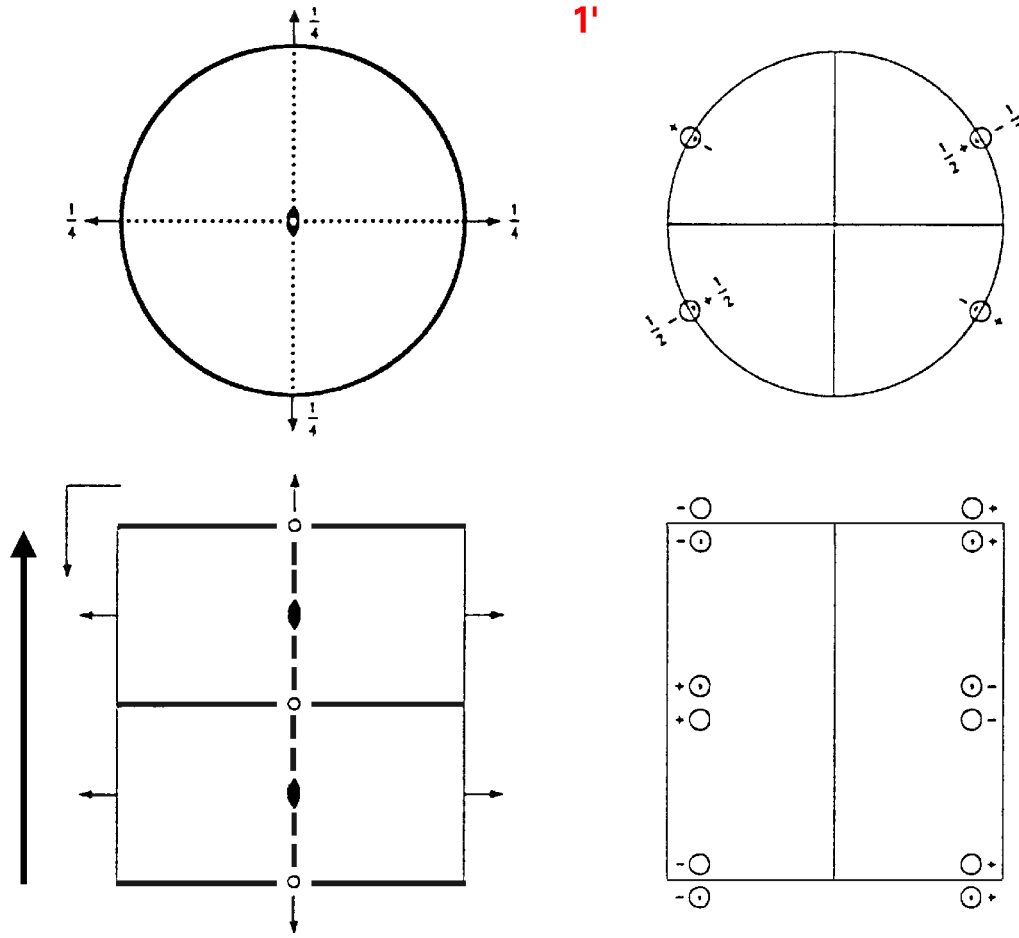
$mmm1'$

Orthorhombic

No. 21.2.105

$p2/c2/c2/m1'$

$1'$



Origin at center ($2/m1'$) at $cc2/m1'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

- | | | | |
|--|------------------------------------|--|--|
| (1) 1
($1 0,0,0$) | (2) 2 $0,0,z$
($2_z 0,0,0$) | (3) 2 $0,y,1/4$
($2_y 0,0,1/2$) | (4) 2 $x,0,1/4$
($2_x 0,0,1/2$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (6) m $x,y,0$
($m_z 0,0,0$) | (7) c $(0,0,1/2)$ $x,0,z$
($m_y 0,0,1/2$) | (8) c $(0,0,1/2)$ $0,y,z$
($m_x 0,0,1/2$) |

For $1' +$ set

- | | | | |
|--|--------------------------------------|--|--|
| (1) $1'$
($1 0,0,0$)' | (2) $2'$ $0,0,z$
($2_z 0,0,0$)' | (3) $2'$ $0,y,1/4$
($2_y 0,0,1/2$)' | (4) $2'$ $x,0,1/4$
($2_x 0,0,1/2$)' |
| (5) $\bar{1}'$ $0,0,0$
($\bar{1} 0,0,0$)' | (6) m' $x,y,0$
($m_z 0,0,0$)' | (7) c' $(0,0,1/2)$ $x,0,z$
($m_y 0,0,1/2$)' | (8) c' $(0,0,1/2)$ $0,y,z$
($m_x 0,0,1/2$)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1' +$
8 g $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $\bar{x},y,\bar{z}+1/2 [0,0,0]$	(4) $x,\bar{y},\bar{z}+1/2 [0,0,0]$
	(5) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(6) $x,y,\bar{z} [0,0,0]$
	(7) $x,\bar{y},z+1/2 [0,0,0]$	(8) $\bar{x},y,z+1/2 [0,0,0]$
4 f $..m1'$	$x,y,0 [0,0,0]$	$\bar{x},\bar{y},0 [0,0,0]$
	$\bar{x},y,1/2 [0,0,0]$	$x,\bar{y},1/2 [0,0,0]$
4 e $..21'$	$0,0,z [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$
	$0,0,\bar{z} [0,0,0]$	$0,0,z+1/2 [0,0,0]$
4 d $.2.1'$	$0,y,1/4 [0,0,0]$	$0,\bar{y},1/4 [0,0,0]$
	$0,\bar{y},3/4 [0,0,0]$	$0,y,3/4 [0,0,0]$
4 c $2..1'$	$x,0,1/4 [0,0,0]$	$\bar{x},0,1/4 [0,0,0]$
	$\bar{x},0,3/4 [0,0,0]$	$x,0,3/4 [0,0,0]$
2 b $2221'$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$
2 a $..2/m1'$	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p2mm1'$	Along [010] $p2mm1'$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c/2$ Origin at $0,y,0$

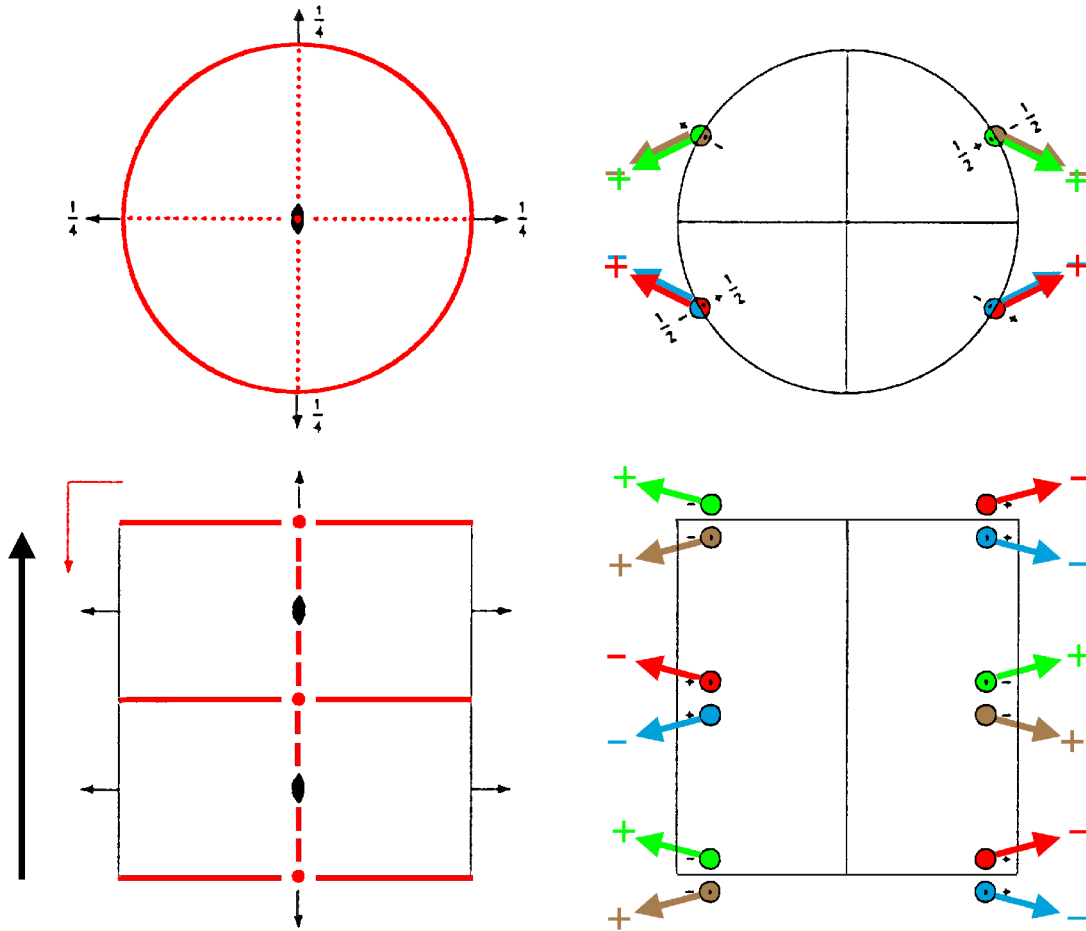
$pc'c'm'$

$m'm'm'$

Orthorhombic

No. 21.3.106

$p2/c'2/c'2/m'$



Origin at center ($2/m'$) at $c'c'2/m'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|-------------------------------------|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 2 $0,y,1/4$
(2_y 0,0,1/2) | (4) 2 $x,0,1/4$
(2_x 0,0,1/2) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m' $x,y,0$
(m_z 0,0,0) | (7) c' $(0,0,1/2)$ $x,0,z$
(m_y 0,0,1/2) | (8) c' $(0,0,1/2)$ $0,y,z$
(m_x 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	(4) $x,\bar{y},\bar{z}+1/2$ [u,\bar{v},\bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [u,v,\bar{w}]	
	(7) $x,\bar{y},z+1/2$ [u,\bar{v},w]	(8) $\bar{x},y,z+1/2$ [\bar{u},v,w]	
	4 f ..m'	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]
		$\bar{x},y,1/2$ [$\bar{u},v,0$]	$x,\bar{y},1/2$ [$u,\bar{v},0$]
	4 e ..2	0,0,z [0,0,w]	0,0, $\bar{z}+1/2$ [0,0, \bar{w}]
		0,0, \bar{z} [0,0, \bar{w}]	0,0,z+1/2 [0,0,w]
4 d .2.	0,y,1/4 [0,v,0]	0, $\bar{y},1/4$ [0, $\bar{v},0$]	
	0, $\bar{y},3/4$ [0, $\bar{v},0$]	0,y,3/4 [0,v,0]	
4 c 2..	x,0,1/4 [u,0,0]	$\bar{x},0,1/4$ [$\bar{u},0,0$]	
	$\bar{x},0,3/4$ [$\bar{u},0,0$]	x,0,3/4 [u,0,0]	
2 b 222	0,0,1/4 [0,0,0]	0,0,3/4 [0,0,0]	
2 a ..2/m'	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]	

Symmetry of special projections

Along [001] 2m'm'	Along [100] p2m'm'	Along [010] p2m'm'
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at 0,y,0

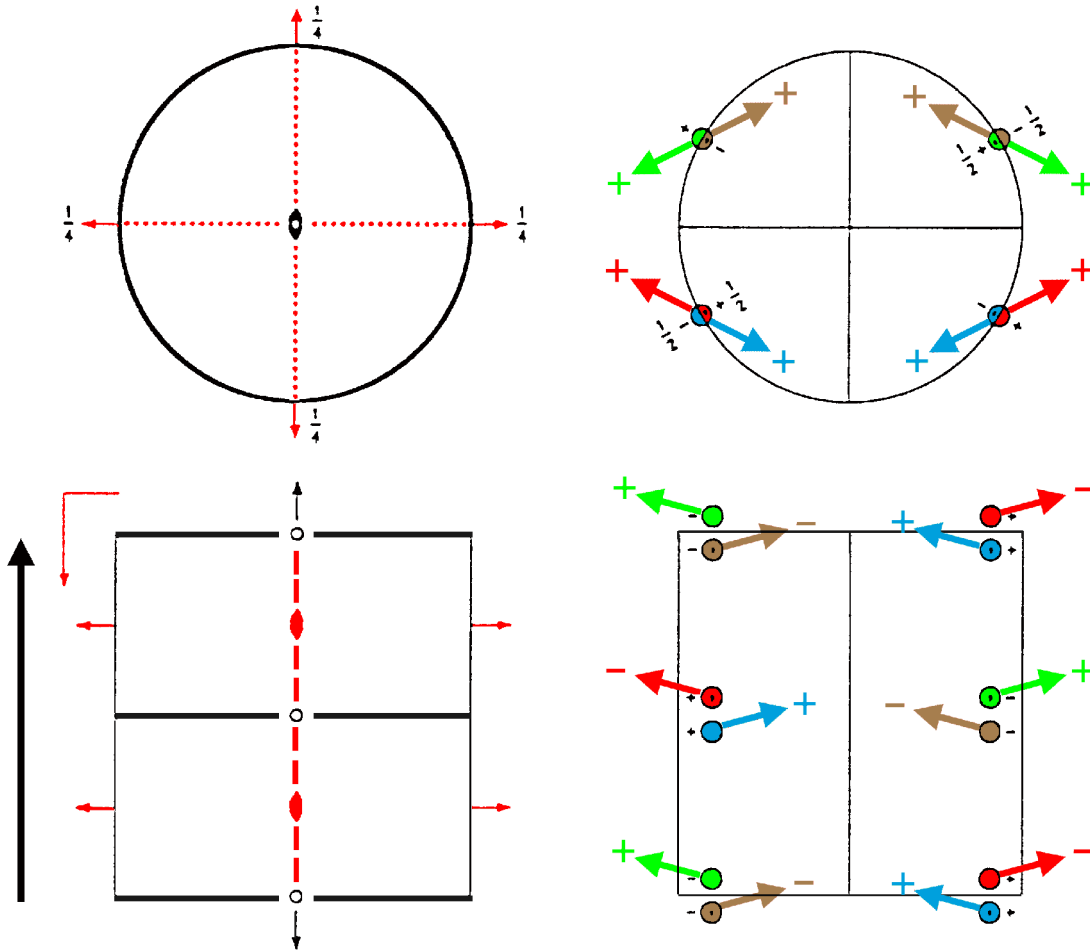
$pc'c'm$

$m'm'm$

Orthorhombic

No. 21.4.107

$p2'c'2'/c'2/m$



Origin at center ($2/m$) at $c'c'2'/m$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|----------------------------------|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 2' $0,y,1/4$
(2_y 0,0,1/2)' | (4) 2' $x,0,1/4$
(2_x 0,0,1/2)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m $x,y,0$
(m_z 0,0,0) | (7) c' (0,0,1/2) $x,0,z$
(m_y 0,0,1/2)' | (8) c' (0,0,1/2) $0,y,z$
(m_x 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{x},y,\bar{z}+1/2$ [u, \bar{v},w]	(4) x, $\bar{y},\bar{z}+1/2$ [\bar{u},v,w]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y, \bar{z} [\bar{u},\bar{v},w]	
	(7) x, $\bar{y},z+1/2$ [u, \bar{v},w]	(8) $\bar{x},y,z+1/2$ [\bar{u},v,w]	
	4 f ..m	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]
		$\bar{x},y,1/2$ [0,0,w]	x, $\bar{y},1/2$ [0,0,w]
	4 e ..2	0,0,z [0,0,w]	0,0, $\bar{z}+1/2$ [0,0,w]
		0,0, \bar{z} [0,0,w]	0,0,z+1/2 [0,0,w]
4 d .2'	0,y,1/4 [u,0,w]	0, $\bar{y},1/4$ [$\bar{u},0,w$]	
	0, $\bar{y},3/4$ [u,0,w]	0,y,3/4 [$\bar{u},0,w$]	
4 c 2'..	x,0,1/4 [0,v,w]	$\bar{x},0,1/4$ [0, \bar{v},w]	
	$\bar{x},0,3/4$ [0,v,w]	x,0,3/4 [0, \bar{v},w]	
2 b 2'2'	0,0,1/4 [0,0,w]	0,0,3/4 [0,0,w]	
2 a ..2/m	0,0,0 [0,0,w]	0,0,1/2 [0,0,w]	

Symmetry of special projections

Along [001] 2mm1'	Along [100] p2'mm'	Along [010] p2'mm'
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at 0,y,0

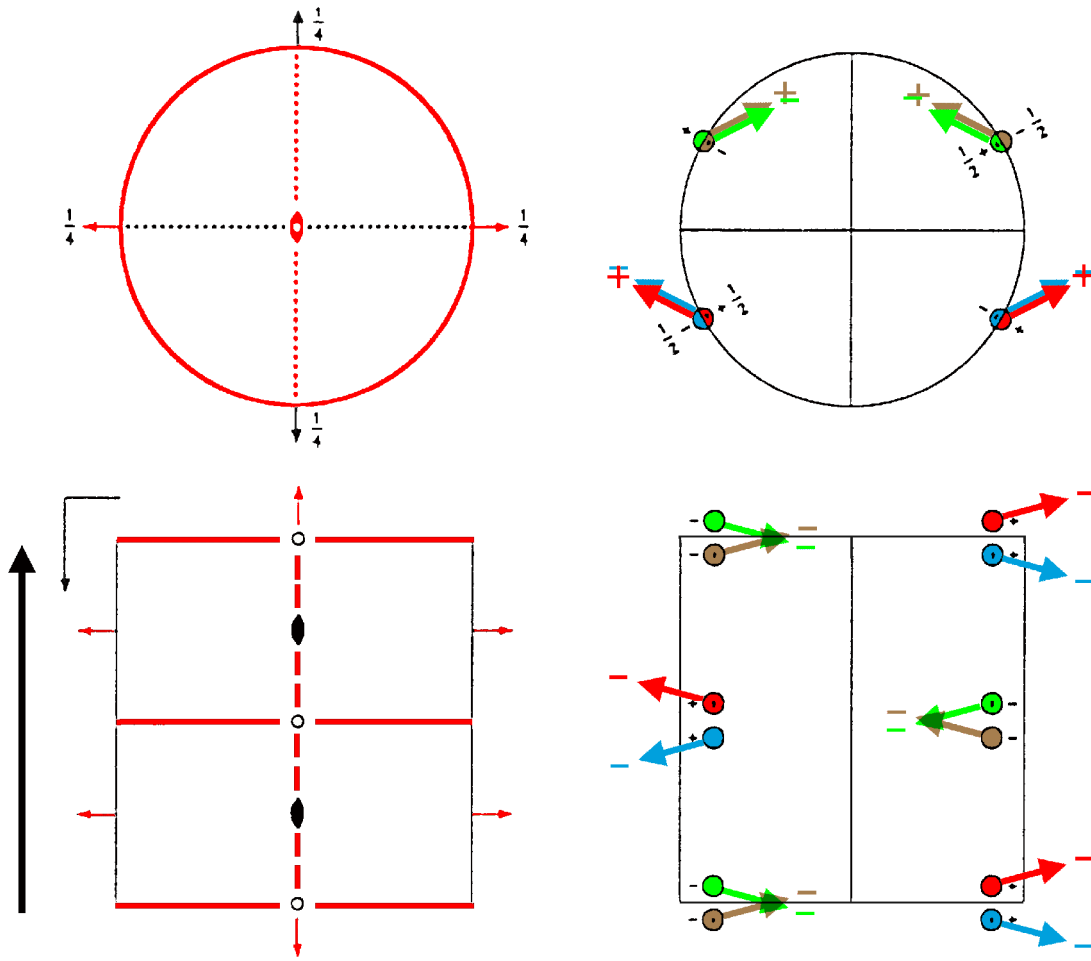
$pcc'm'$

$mm'm'$

Orthorhombic

No. 21.5.108

$p2/c2'/c2'/m'$



Origin at center ($2'/m'$) at $cc'2'/m'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|------------------------------------|--|--|
| (1) 1
(1 0,0,0) | (2) $2'$ 0,0,z
(2_z 0,0,0)' | (3) $2'$ 0,y, $1/4$
(2_y 0,0, $1/2$)' | (4) 2 x,0, $1/4$
(2_x 0,0, $1/2$) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m' x,y,0
(m_z 0,0,0)' | (7) c' (0,0, $1/2$) x,0,z
(m_y 0,0, $1/2$)' | (8) c (0,0, $1/2$) 0,y,z
(m_x 0,0, $1/2$) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	
	(3) $\bar{x},y,\bar{z}+1/2$ [u, \bar{v} ,w]	(4) x, $\bar{y},\bar{z}+1/2$ [u, \bar{v},\bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y, \bar{z} [u,v, \bar{w}]	
	(7) x, $\bar{y},z+1/2$ [u, \bar{v} ,w]	(8) $\bar{x},y,z+1/2$ [u, \bar{v},\bar{w}]	
	4 f ..m'	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [u,v,0]
		$\bar{x},y,1/2$ [u, \bar{v} ,0]	x, $\bar{y},1/2$ [u, \bar{v} ,0]
	4 e ..2'	0,0,z [u,v,0]	0,0, $\bar{z}+1/2$ [u, \bar{v} ,0]
		0,0, \bar{z} [u,v,0]	0,0,z+1/2 [u, \bar{v} ,0]
4 d .2'	0,y,1/4 [u,0,w]	0, $\bar{y},1/4$ [u,0, \bar{w}]	
	0, $\bar{y},3/4$ [u,0,w]	0,y,3/4 [u,0, \bar{w}]	
4 c 2..	x,0,1/4 [u,0,0]	$\bar{x},0,1/4$ [u,0,0]	
	$\bar{x},0,3/4$ [u,0,0]	x,0,3/4 [u,0,0]	
2 b 22'2'	0,0,1/4 [u,0,0]	0,0,3/4 [u,0,0]	
2 a ..2'/m'	0,0,0 [u,v,0]	0,0,1/2 [u, \bar{v} ,0]	

Symmetry of special projections

Along [001] 2'mm'	Along [100] $p_{2a^*}2mm$	Along [010] $p2'm'm$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at 0,y,0

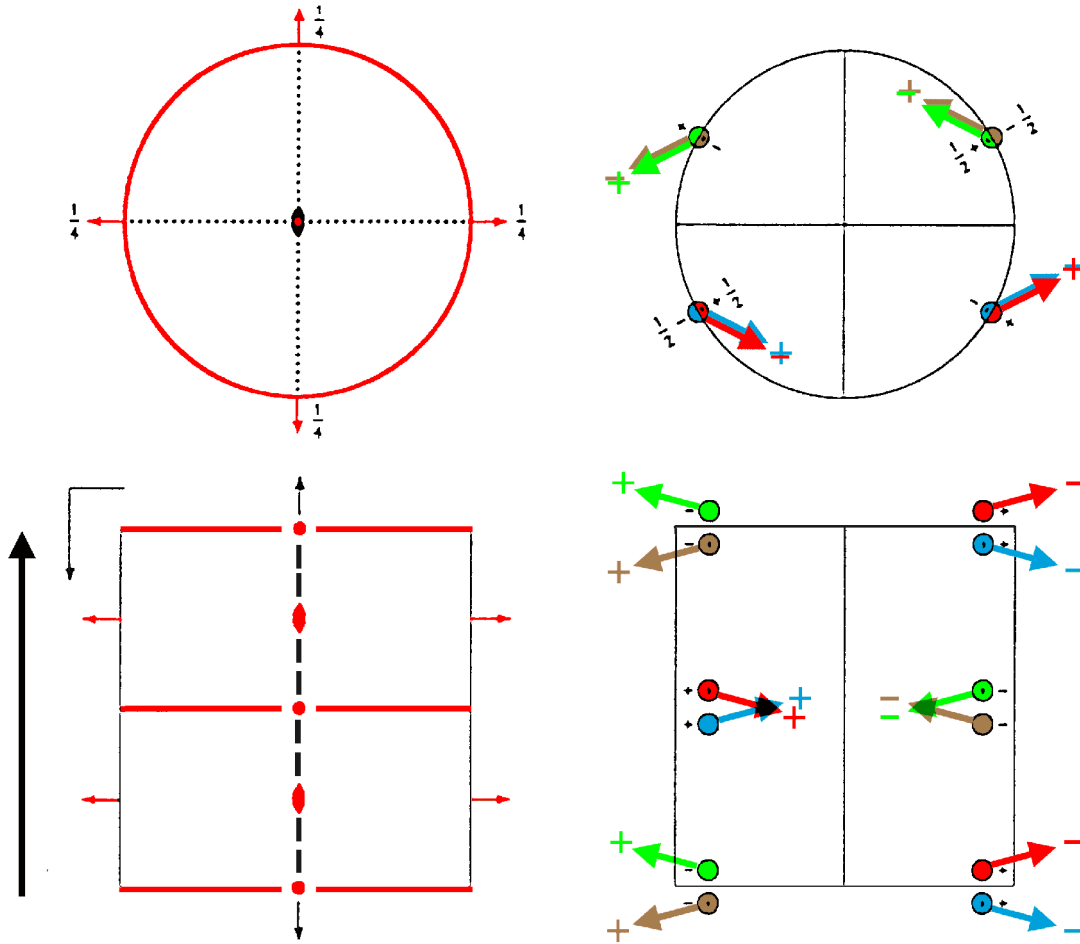
$pccm'$

mmm'

Orthorhombic

No. 21.6.109

$p2'/c2'/c2'/m'$



Origin at center ($2/m'$) at $cc2'/m'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2_{0,0,z}$
(2_z |0,0,0)

(3) $2'_{0,y,1/4}$
(2_y |0,0,1/2)'

(4) $2'_{x,0,1/4}$
(2_x |0,0,1/2)'

(5) $\bar{1}'_{0,0,0}$
($\bar{1}$ |0,0,0)'

(6) m'_x
(m_z |0,0,0)'

(7) $c_{(0,0,1/2)}$
(m_y |0,0,1/2)

(8) $c_{(0,0,1/2)}$
(m_x |0,0,1/2)

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{x},y,\bar{z}+1/2$ [u, \bar{v},w]	(4) $x,\bar{y},\bar{z}+1/2$ [\bar{u},v,w]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [u,v, \bar{w}]	
	(7) $x,\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	(8) $\bar{x},y,z+1/2$ [u, \bar{v},\bar{w}]	
	4 f ..m'	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]
		$\bar{x},y,1/2$ [u, $\bar{v},0$]	$x,\bar{y},1/2$ [$\bar{u},v,0$]
	4 e ..2	$0,0,z$ [0,0,w]	$0,0,\bar{z}+1/2$ [0,0,w]
		$0,0,\bar{z}$ [0,0, \bar{w}]	$0,0,z+1/2$ [0,0, \bar{w}]
4 d .2'	$0,y,1/4$ [u,0,w]	$0,\bar{y},1/4$ [$\bar{u},0,w$]	
	$0,\bar{y},3/4$ [$\bar{u},0,\bar{w}$]	$0,y,3/4$ [u,0, \bar{w}]	
4 c 2'..	$x,0,1/4$ [0,v,w]	$\bar{x},0,1/4$ [0, \bar{v},w]	
	$\bar{x},0,3/4$ [0, \bar{v},\bar{w}]	$x,0,3/4$ [0,v, \bar{w}]	
2 b 2'2'2	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0, \bar{w}]	
2 a ..2/m'	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	

Symmetry of special projections

Along [001] 2mm	Along [100] $p_{2a^*}2m'm'$	Along [010] $p_{2a^*}2m'm'$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at 0,y,0

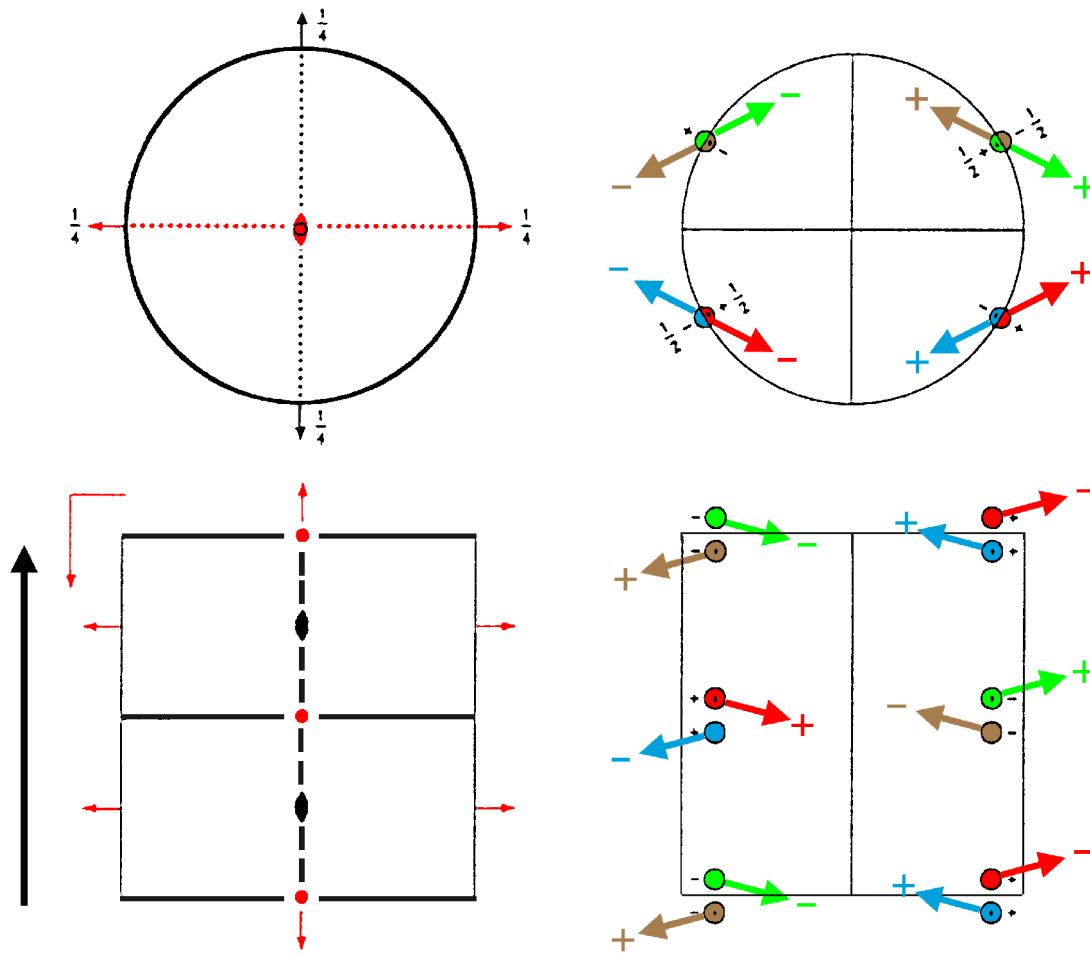
$pc'cm$

$m'mm$

Orthorhombic

No. 21.7.110

$p2/c'2'/c2'/m$



Origin at center ($2'/m$) at $c'c2'/m$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|---|---------------------------------------|---|--|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,0,z
($2'_z$ 0,0,0)' | (3) $2'_y$ 0,y, $1/4$
($2'_y$ 0,0, $1/2$)' | (4) $2'_x$ x,0, $1/4$
($2'_x$ 0,0, $1/2$)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) m x,y,0
(m_z 0,0,0) | (7) c (0,0, $1/2$) x,0,z
(m_y 0,0, $1/2$)' | (8) c'_z (0,0, $1/2$) 0,y,z
(m_x 0,0, $1/2$)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	
	(3) $\bar{x},y,\bar{z}+1/2$ [u, \bar{v} ,w]	(4) $x,\bar{y},\bar{z}+1/2$ [u, \bar{v} , \bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u} , \bar{v} , \bar{w}]	(6) x,y,\bar{z} [\bar{u} , \bar{v} ,w]	
	(7) $x,\bar{y},z+1/2$ [\bar{u} ,v, \bar{w}]	(8) $\bar{x},y,z+1/2$ [\bar{u} ,v,w]	
	4 f ..m	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0, \bar{w}]
		$\bar{x},y,1/2$ [0,0,w]	$x,\bar{y},1/2$ [0,0, \bar{w}]
	4 e ..2'	$0,0,z$ [u,v,0]	$0,0,\bar{z}+1/2$ [u, \bar{v} ,0]
		$0,0,\bar{z}$ [\bar{u} , \bar{v} ,0]	$0,0,z+1/2$ [\bar{u} ,v,0]
4 d ..2'	$0,y,1/4$ [u,0,w]	$0,\bar{y},1/4$ [u,0, \bar{w}]	
	$0,\bar{y},3/4$ [\bar{u} ,0, \bar{w}]	$0,y,3/4$ [\bar{u} ,0,w]	
4 c 2..	$x,0,1/4$ [u,0,0]	$\bar{x},0,1/4$ [\bar{u} ,0,0]	
	$\bar{x},0,3/4$ [u,0,0]	$x,0,3/4$ [\bar{u} ,0,0]	
2 b 22'2'	$0,0,1/4$ [u,0,0]	$0,0,3/4$ [\bar{u} ,0,0]	
2 a ..2'/m	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	

Symmetry of special projections

Along [001] $2mm1'$ Origin at 0,0,z	Along [100] $p2mm$ $a^* = c/2$ Origin at x,0,0	Along [010] $p_{2a^*}2mm$ $a^* = c/2$ Origin at 0,y,0
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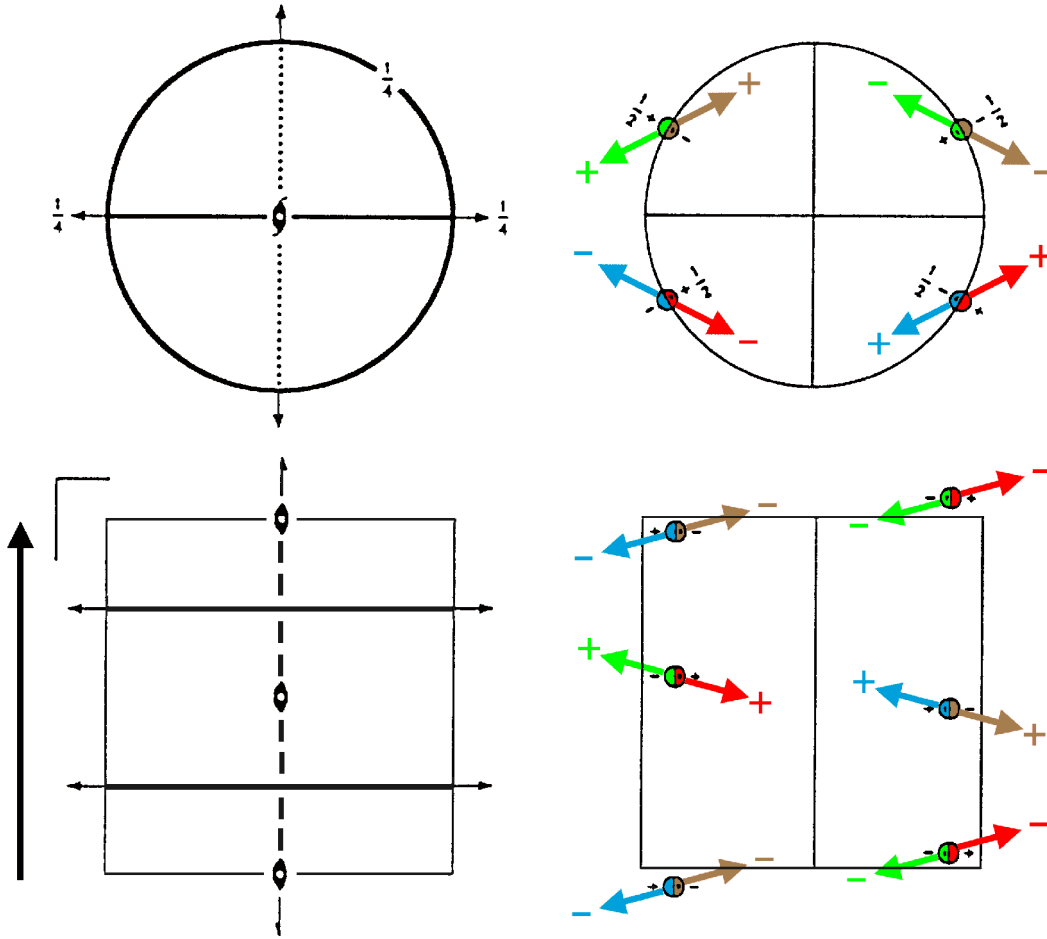
pmcm

mmm

Orthorhombic

No. 22.1.111

$p2/m2/c2_1/m$



Origin at center ($2/m$) at $2/mc2_1$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--|--|----------------------------------|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,y,1/4$
($2_y 0,0,1/2$) | (3) 2 $x,0,0$
($2_x 0,0,0$) | (4) 2 $(0,0,1/2)$ $0,0,z$
($2_z 0,0,1/2$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (6) c $(0,0,1/2)$ $x,0,z$
($m_y 0,0,1/2$) | (7) m $0,y,z$
($m_x 0,0,0$) | (8) m $x,y,1/4$
($m_z 0,0,1/2$) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	
	(3) x,\bar{y},\bar{z} [u, \bar{v},\bar{w}]	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x,\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	
	(7) \bar{x},y,z [u, \bar{v},\bar{w}]	(8) $x,y,\bar{z}+1/2$ [\bar{u},\bar{v},w]	
	4 e ..m	$x,y,1/4$ [0,0,w]	$\bar{x},y,1/4$ [0,0, \bar{w}]
		$x,\bar{y},3/4$ [0,0, \bar{w}]	$\bar{x},\bar{y},3/4$ [0,0,w]
	4 d m..	$0,y,z$ [u,0,0]	$0,y,\bar{z}+1/2$ [$\bar{u},0,0$]
		$0,\bar{y},\bar{z}$ [u,0,0]	$0,\bar{y},z+1/2$ [$\bar{u},0,0$]
4 c 2..	$x,0,0$ [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]	
	$\bar{x},0,0$ [u,0,0]	$x,0,1/2$ [$\bar{u},0,0$]	
2 b m2m	$0,y,1/4$ [0,0,0]	$0,\bar{y},3/4$ [0,0,0]	
2 a 2/m..	$0,0,0$ [u,0,0]	$0,0,1/2$ [$\bar{u},0,0$]	

Symmetry of special projections

Along [001] $2mm1'$	Along [100] $p2mg1'$	Along [010] $p_{2a^*}2mm$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at 0,y,1/4

pmcm1'

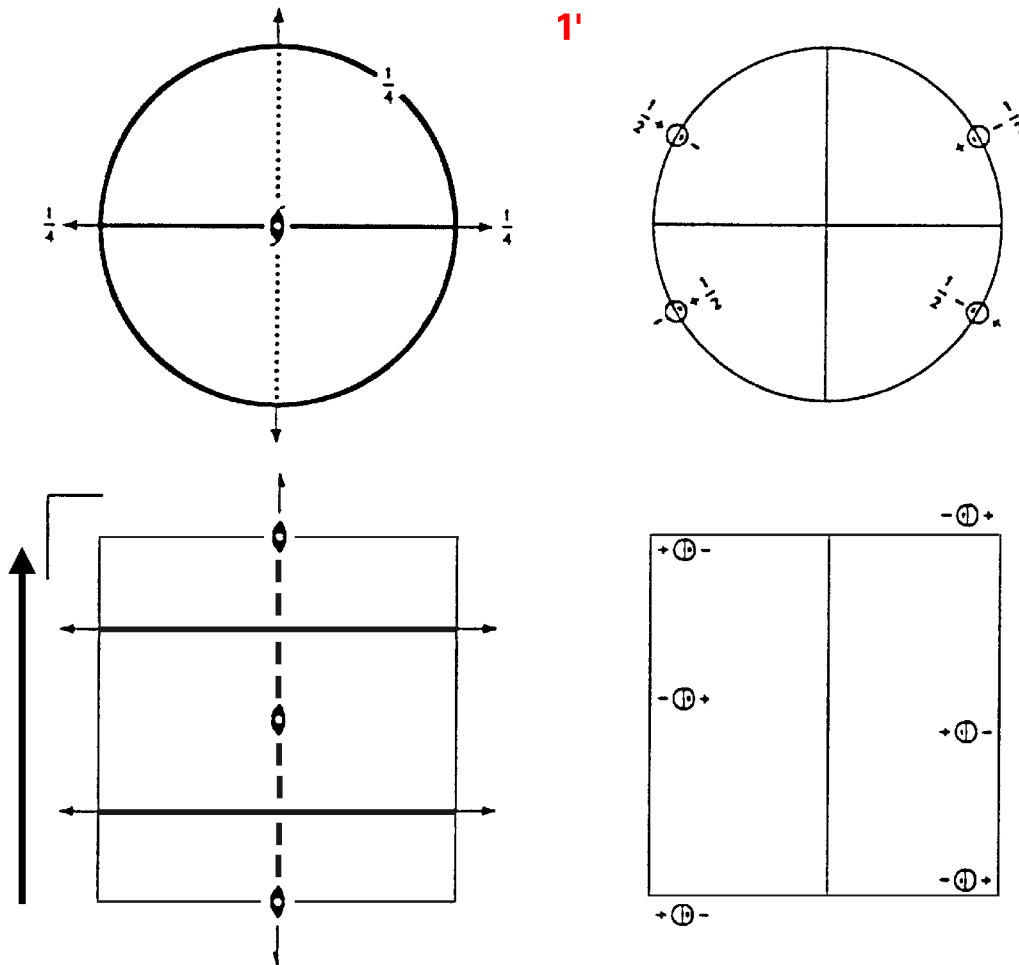
mmm1'

Orthorhombic

No. 22.2.112

p2/m2/c2₁/m1'

1'



Origin at center (2/m1') at 2/mc2₁1'

Asymmetric unit $0 \leq x; 0 \leq z \leq 1/4$

Symmetry operations

For 1 + set

- | | | | |
|--|---|---|--|
| (1) 1
(1 0,0,0) | (2) 2 _y 0,y,1/4
(2 _y 0,0,1/2) | (3) 2 _x x,0,0
(2 _x 0,0,0) | (4) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) c (0,0,1/2) x,0,z
(m _y 0,0,1/2) | (7) m 0,y,z
(m _x 0,0,0) | (8) m x,y,1/4
(m _z 0,0,1/2) |

For 1' + set

- | | | | |
|--|--|--|---|
| (1) 1'
(1 0,0,0)' | (2) 2' _y 0,y,1/4
(2' _y 0,0,1/2)' | (3) 2' _x x,0,0
(2' _x 0,0,0)' | (4) 2' (0,0,1/2) 0,0,z
(2' _z 0,0,1/2)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (6) c' (0,0,1/2) x,0,z
(m' _y 0,0,1/2)' | (7) m' 0,y,z
(m' _x 0,0,0)' | (8) m' x,y,1/4
(m' _z 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
8 f 11'	(1) x,y,z [0,0,0]	(2) $\bar{x},y,\bar{z}+1/2$ [0,0,0]
	(3) x,\bar{y},\bar{z} [0,0,0]	(4) $\bar{x},\bar{y},z+1/2$ [0,0,0]
	(5) \bar{x},\bar{y},\bar{z} [0,0,0]	(6) $x,\bar{y},z+1/2$ [0,0,0]
	(7) \bar{x},y,z [0,0,0]	(8) $x,y,\bar{z}+1/2$ [0,0,0]
4 e ..m1'	x,y,1/4 [0,0,0]	$\bar{x},y,1/4$ [0,0,0]
	$x,\bar{y},3/4$ [0,0,0]	$\bar{x},\bar{y},3/4$ [0,0,0]
4 d m..1'	0,y,z [0,0,0]	0,y, $\bar{z}+1/2$ [0,0,0]
	0, \bar{y},\bar{z} [0,0,0]	0, $\bar{y},z+1/2$ [0,0,0]
4 c 2..1'	x,0,0 [0,0,0]	$\bar{x},0,1/2$ [0,0,0]
	$\bar{x},0,0$ [0,0,0]	x,0,1/2 [0,0,0]
2 b m2m1'	0,y,1/4 [0,0,0]	0, $\bar{y},3/4$ [0,0,0]
2 a 2/m..1'	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]

Symmetry of special projections

Along [001] 2mm1'	Along [100] p2mg1'	Along [010] p2mm1'
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at 0,y,0

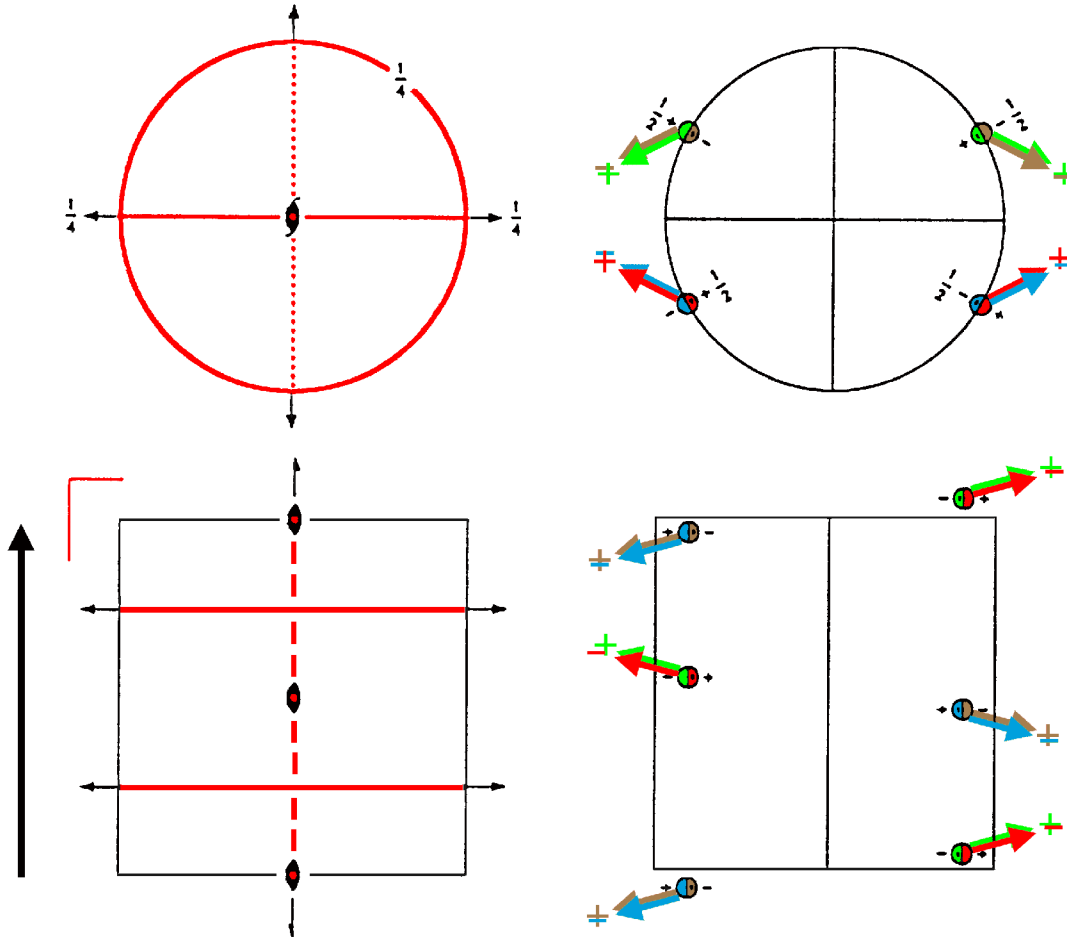
$pm'c'm'$

$m'm'm'$

Orthorhombic

No. 22.3.113

$p2/m'2/c'2_1/m'$



Origin at center ($2/m'$) at $2/m'c'2_1$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--|---|------------------------------------|--|
| (1) 1
(1 0,0,0) | (2) $2_{0,y,1/4}$
(2_y 0,0,1/2) | (3) $2_{x,0,0}$
(2_x 0,0,0) | (4) $2_{(0,0,1/2)}$ 0,0,z
(2_z 0,0,1/2) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) c' (0,0,1/2) x,0,z
(m_y 0,0,1/2) | (7) m' 0,y,z
(m_x 0,0,0) | (8) m' x,y,1/4
(m_z 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	
	(3) x,\bar{y},\bar{z} [u, \bar{v},\bar{w}]	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x,\bar{y},z+1/2$ [u, \bar{v},w]	
	(7) \bar{x},y,z [\bar{u},v,w]	(8) $x,y,\bar{z}+1/2$ [u,v, \bar{w}]	
	4 e ..m'	$x,y,1/4$ [u,v,0]	$\bar{x},y,1/4$ [$\bar{u},v,0$]
		$x,\bar{y},3/4$ [u, $\bar{v},0$]	$\bar{x},\bar{y},3/4$ [$\bar{u},\bar{v},0$]
	4 d m'..	$0,y,z$ [0,v,w]	$0,y,\bar{z}+1/2$ [0,v, \bar{w}]
		$0,\bar{y},\bar{z}$ [0, \bar{v},\bar{w}]	$0,\bar{y},z+1/2$ [0, \bar{v},w]
4 c 2..	$x,0,0$ [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]	
	$\bar{x},0,0$ [$\bar{u},0,0$]	$x,0,1/2$ [u,0,0]	
2 b m'2m'	$0,y,1/4$ [0,v,0]	$0,\bar{y},3/4$ [0, $\bar{v},0$]	
2 a 2/m'..	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	

Symmetry of special projections

Along [001] 2m'm'	Along [100] p2m'g'	Along [010] p2m'm'
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at 0,y,0

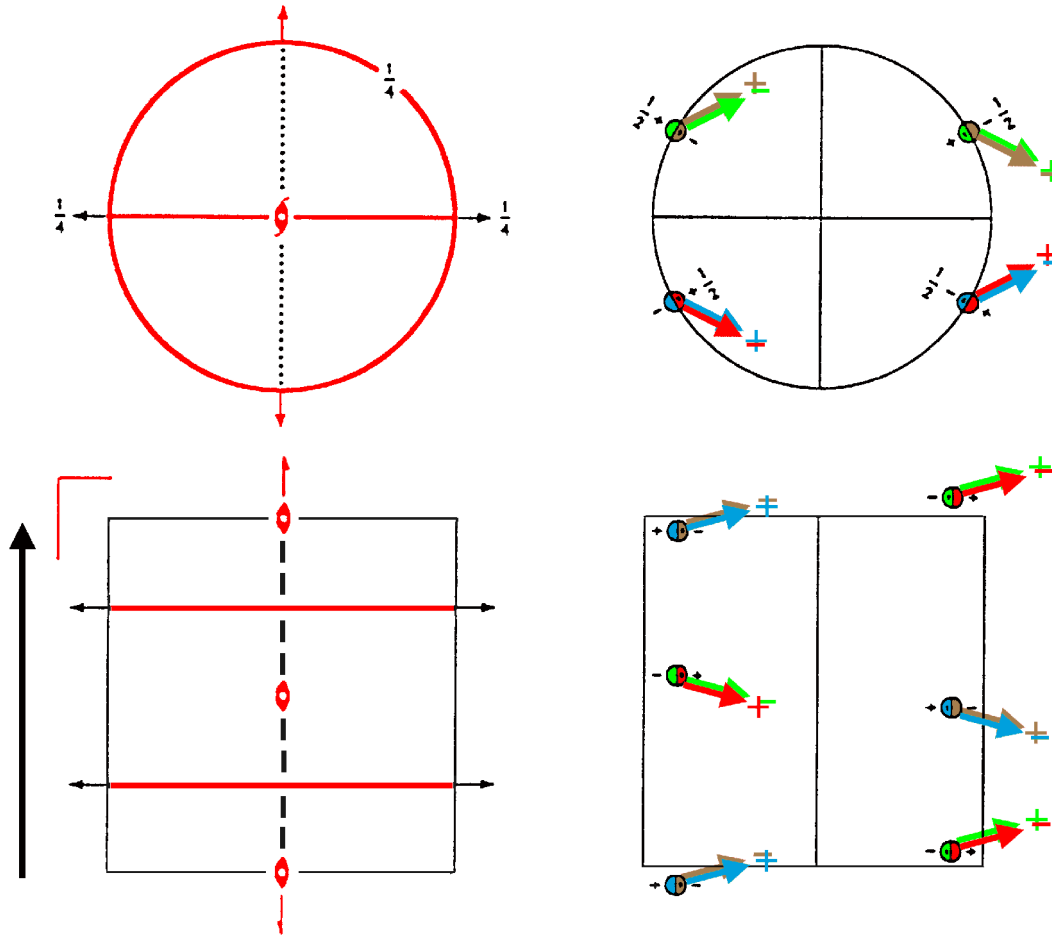
$pm'cm'$

$m'mm'$

Orthorhombic

No. 22.4.114

$p2'/m'2/c2_1'/m'$



Origin at center ($2'/m'$) at $2'/m'c2_1'$

Asymmetric unit $0 \leq x$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--|--|------------------------------------|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,y,1/4$
($2_y 0,0,1/2$) | (3) $2' x,0,0$
($2_x 0,0,0$)' | (4) $2' (0,0,1/2) 0,0,z$
($2_z 0,0,1/2$)' |
| (5) $\bar{1} 0,0,0$
($\bar{1} 0,0,0$) | (6) c ($0,0,1/2$) $x,0,z$
($m_y 0,0,1/2$) | (7) $m' 0,y,z$
($m_x 0,0,0$)' | (8) $m' x,y,1/4$
($m_z 0,0,1/2$)' |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	
	(3) x,\bar{y},\bar{z} [\bar{u},v,w]	(4) $\bar{x},\bar{y},z+1/2$ [u,v,\bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x,\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	
	(7) \bar{x},y,z [\bar{u},v,w]	(8) $x,y,\bar{z}+1/2$ [u,v,\bar{w}]	
	4 e ..m'	x,y,1/4 [u,v,0]	$\bar{x},y,1/4$ [$\bar{u},v,0$]
		$x,\bar{y},3/4$ [$\bar{u},v,0$]	$\bar{x},\bar{y},3/4$ [$u,v,0$]
	4 d m'..	0,y,z [0,v,w]	$0,y,\bar{z}+1/2$ [0,v, \bar{w}]
		$0,\bar{y},\bar{z}$ [0,v,w]	$0,\bar{y},z+1/2$ [0,v, \bar{w}]
4 c 2'..	x,0,0 [0,v,w]	$\bar{x},0,1/2$ [0,v, \bar{w}]	
	$\bar{x},0,0$ [0,v,w]	x,0,1/2 [0,v, \bar{w}]	
2 b m'2m'	0,y,1/4 [0,v,0]	$0,\bar{y},3/4$ [0,v,0]	
2 a 2'/m'..	0,0,0 [0,v,w]	0,0,1/2 [0,v, \bar{w}]	

Symmetry of special projections

Along [001] 2'm'm	Along [100] p2mg $a^* = c$	Along [010] $p_{2a^*} 2m'm'$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,1/4

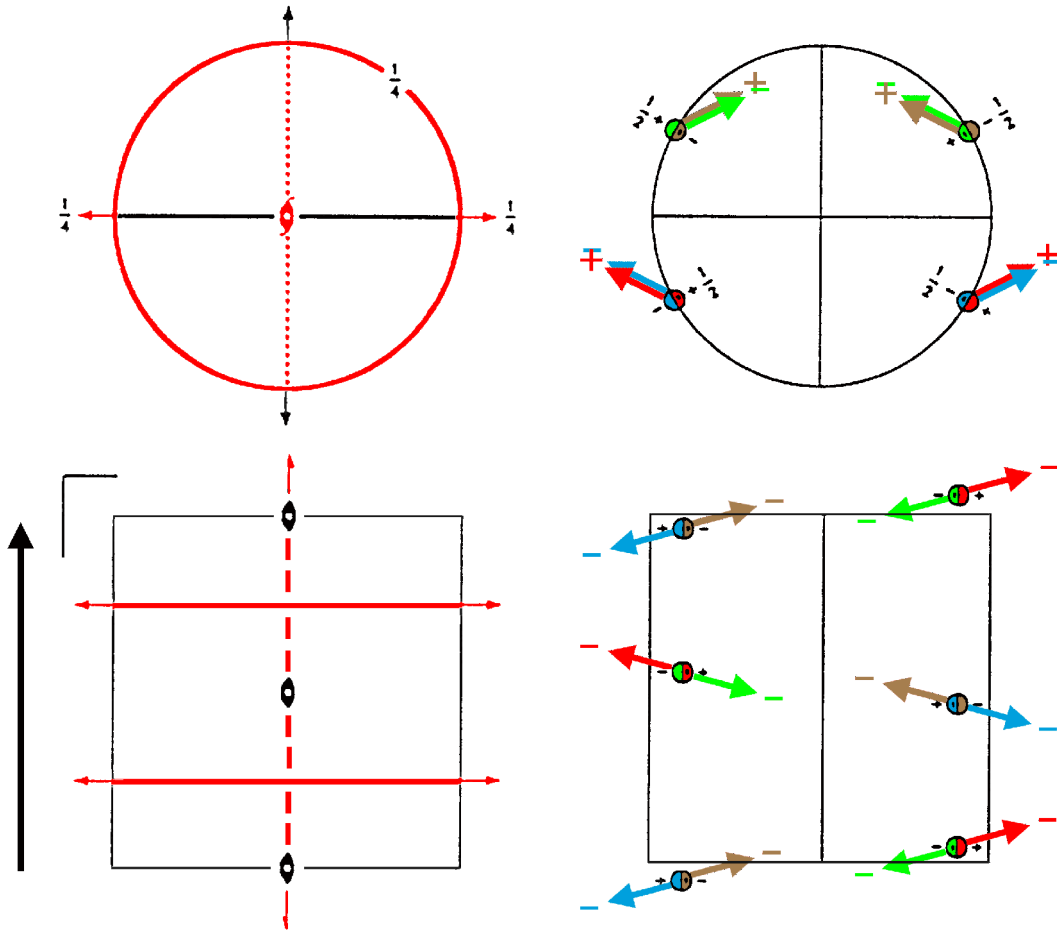
$pmc'm'$

$mm'm'$

Orthorhombic

No. 22.5.115

$p2/m2'/c'2_1'/m'$



Origin at center ($2/m$) at $2/mc'2_1'$

Asymmetric unit $0 \leq x$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--|--|----------------------------------|--|
| (1) 1
(1 0,0,0) | (2) $2'_y$ 0,y,1/4
(2_y 0,0,1/2)' | (3) 2 $x,0,0$
(2_x 0,0,0) | (4) $2'_z$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) c'_x (0,0,1/2) x,0,z
(m_y 0,0,1/2)' | (7) m 0,y,z
(m_x 0,0,0) | (8) m'_y x,y,1/4
(m_z 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y,\bar{z}+1/2$ [u, \bar{v} ,w]	
	(3) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x,\bar{y},z+1/2$ [u, \bar{v} ,w]	
	(7) \bar{x},y,z [u, \bar{v} , \bar{w}]	(8) $x,y,\bar{z}+1/2$ [u,v, \bar{w}]	
	4 e ..m'	$x,y,1/4$ [u,v,0]	$\bar{x},y,1/4$ [u, \bar{v} ,0]
		$x,\bar{y},3/4$ [u, \bar{v} ,0]	$\bar{x},\bar{y},3/4$ [u,v,0]
	4 d m..	$0,y,z$ [u,0,0]	$0,y,\bar{z}+1/2$ [u,0,0]
		$0,\bar{y},\bar{z}$ [u,0,0]	$0,\bar{y},z+1/2$ [u,0,0]
4 c 2..	$x,0,0$ [u,0,0]	$\bar{x},0,1/2$ [u,0,0]	
	$\bar{x},0,0$ [u,0,0]	$x,0,1/2$ [u,0,0]	
2 b m2'm'	$0,y,1/4$ [u,0,0]	$0,\bar{y},3/4$ [u,0,0]	
2 a 2/m..	$0,0,0$ [u,0,0]	$0,0,1/2$ [u,0,0]	

Symmetry of special projections

Along [001] 2'mm'	Along [100] p2mg1'	Along [010] p2'm'm
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}/2$ Origin at 0,y,0

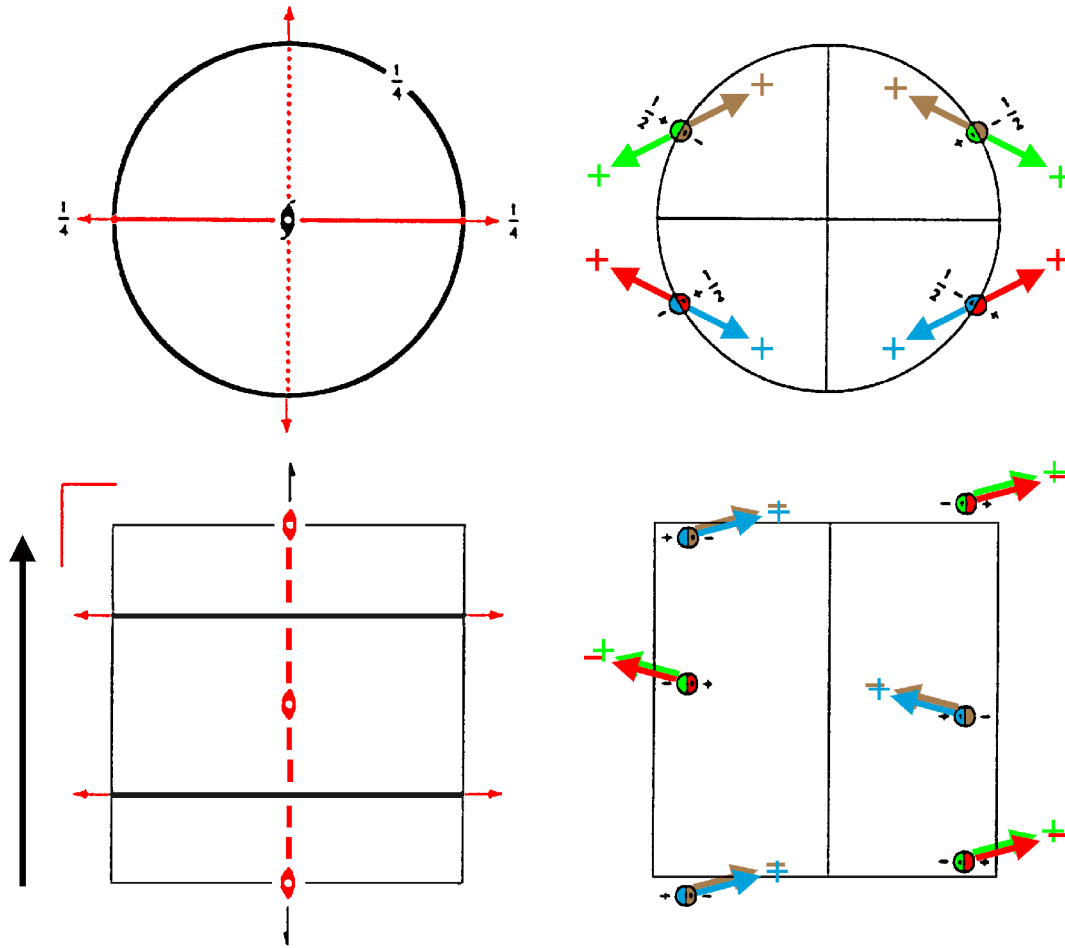
$pm'c'm$

$m'm'm$

Orthorhombic

No. 22.6.116

$p2'/m'2'/c'2_1/m$



Origin at center ($2'/m'$) at $2'/m'c'2_1$

Asymmetric unit $0 \leq x$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--|--|--------------------------------------|--|
| (1) 1
(1 0,0,0) | (2) $2'$ $0,y,1/4$
($2_y 0,0,1/2$)' | (3) $2'$ $x,0,0$
($2_x 0,0,0$)' | (4) 2 $(0,0,1/2)$ $0,0,z$
($2_z 0,0,1/2$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (6) c' $(0,0,1/2)$ $x,0,z$
($m_y 0,0,1/2$)' | (7) m' $0,y,z$
($m_x 0,0,0$)' | (8) m $x,y,1/4$
($m_z 0,0,1/2$) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y,\bar{z}+1/2$ [u, \bar{v} ,w]	
	(3) x, \bar{y},\bar{z} [\bar{u} ,v,w]	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u} , \bar{v} ,w]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x, $\bar{y},z+1/2$ [u, \bar{v} ,w]	
	(7) \bar{x},y,z [\bar{u} ,v,w]	(8) x,y, $\bar{z}+1/2$ [\bar{u} , \bar{v} ,w]	
	4 e ..m	x,y,1/4 [0,0,w]	$\bar{x},y,1/4$ [0,0,w]
		x, $\bar{y},3/4$ [0,0,w]	$\bar{x},\bar{y},3/4$ [0,0,w]
	4 d m'..	0,y,z [0,v,w]	0,y, $\bar{z}+1/2$ [0, \bar{v} ,w]
		0, \bar{y},\bar{z} [0,v,w]	0, $\bar{y},z+1/2$ [0, \bar{v} ,w]
4 c 2'..	x,0,0 [0,v,w]	$\bar{x},0,1/2$ [0, \bar{v} ,w]	
	$\bar{x},0,0$ [0,v, \bar{w}]	x,0,1/2 [0, \bar{v} ,w]	
2 b m'2'm	0,y,1/4 [0,0,w]	0, $\bar{y},3/4$ [0,0,w]	
2 a 2'/m'..	0,0,0 [0,v,w]	0,0,1/2 [0, \bar{v} ,w]	

Symmetry of special projections

Along [001] 2m'm'	Along [100] p2'mg'	Along [010] p2'mm'
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}/2$ Origin at 0,y,0

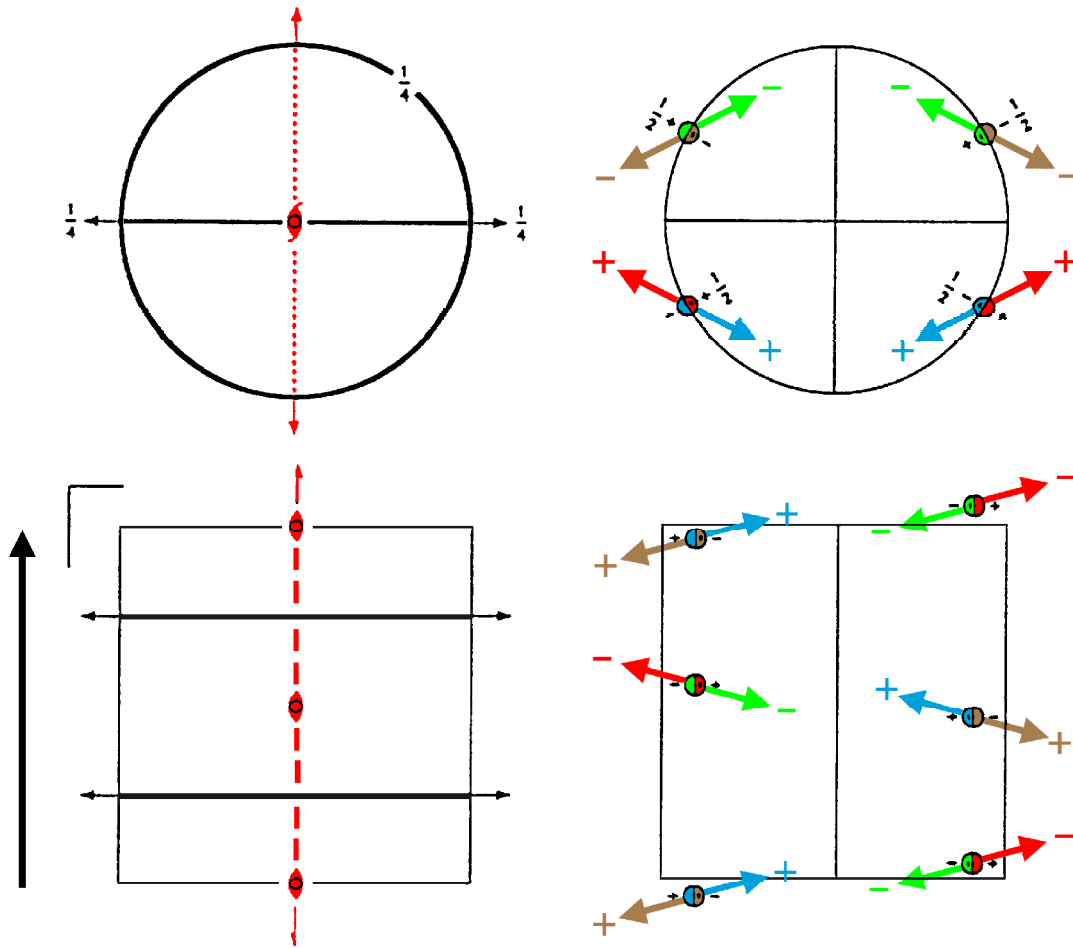
$pmc'm$

$mm'm$

Orthorhombic

No. 22.7.117

$p2'm2/c'2_1'/m$



Origin at center ($2'/m$) at $2'/mc'2_1'$

Asymmetric unit $0 \leq x$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,y,1/4$
($2_y 0,0,1/2$) | (3) $2'_x$ $x,0,0$
($2_x 0,0,0$)' | (4) $2'_z$ $(0,0,1/2)$ $0,0,z$
($2_z 0,0,1/2$)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$)' | (6) c'_z $(0,0,1/2)$ $x,0,z$
($m_y 0,0,1/2$)' | (7) m $0,y,z$
($m_x 0,0,0$) | (8) m $x,y,1/4$
($m_z 0,0,1/2$) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	
	(3) x,\bar{y},\bar{z} [\bar{u},v,w]	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x,\bar{y},z+1/2$ [u, \bar{v},w]	
	(7) \bar{x},y,z [u, \bar{v},\bar{w}]	(8) $x,y,\bar{z}+1/2$ [\bar{u},\bar{v},w]	
	4 e ..m	$x,y,1/4$ [0,0,w]	$\bar{x},y,1/4$ [0,0, \bar{w}]
		$x,\bar{y},3/4$ [0,0,w]	$\bar{x},\bar{y},3/4$ [0,0, \bar{w}]
	4 d m..	$0,y,z$ [u,0,0]	$0,y,\bar{z}+1/2$ [$\bar{u},0,0$]
		$0,\bar{y},\bar{z}$ [$\bar{u},0,0$]	$0,\bar{y},z+1/2$ [u,0,0]
4 c 2'..	$x,0,0$ [0,v,w]	$\bar{x},0,1/2$ [0,v, \bar{w}]	
	$\bar{x},0,0$ [0, \bar{v},\bar{w}]	$x,0,1/2$ [0, \bar{v},w]	
2 b m2m	$0,y,1/4$ [0,0,0]	$0,\bar{y},3/4$ [0,0,0]	
2 a 2'/m..	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	

Symmetry of special projections

Along [001] 2mm1'	Along [100] p2mg1'	Along [010] p2mm
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}/2$ Origin at 0,y,0

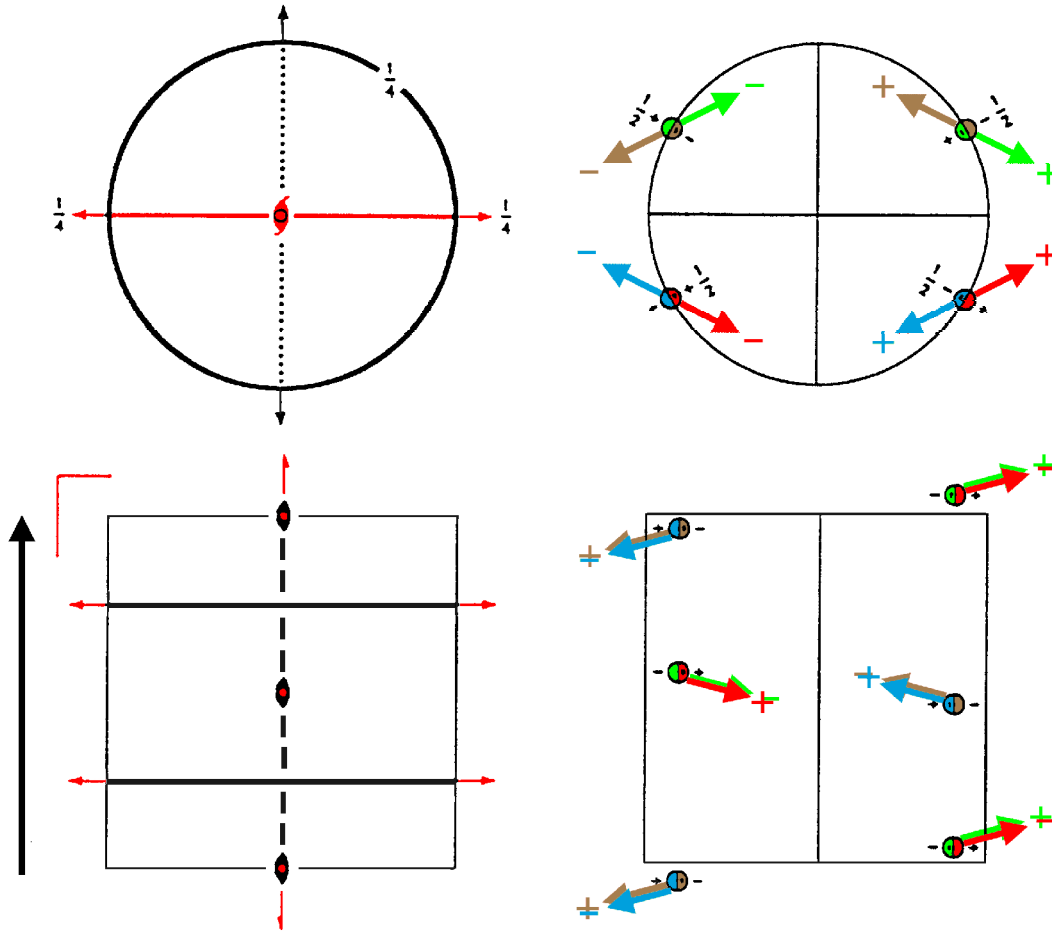
pm'cm

m'mm

Orthorhombic

No. 22.8.118

$p2/m'2'/c2_1'/m$



Origin at center ($2/m'$) at $2/m'c2_1'$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|--|--------------------------------------|--|
| (1) 1
(1 0,0,0) | (2) $2'$ $0,y,1/4$
($2_y 0,0,1/2$)' | (3) 2 $x,0,0$
($2_x 0,0,0$) | (4) $2'$ $(0,0,1/2)$ $0,0,z$
($2_z 0,0,1/2$)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$)' | (6) c $(0,0,1/2)$ $x,0,z$
($m_y 0,0,1/2$) | (7) m' $0,y,z$
($m_x 0,0,0$)' | (8) m $x,y,1/4$
($m_z 0,0,1/2$) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y,\bar{z}+1/2$ [u, \bar{v} ,w]	
	(3) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u} , \bar{v} , \bar{w}]	(6) $x,\bar{y},z+1/2$ [\bar{u} ,v, \bar{w}]	
	(7) \bar{x},y,z [\bar{u} ,v,w]	(8) $x,y,\bar{z}+1/2$ [\bar{u} , \bar{v} ,w]	
	4 e ..m	$x,y,1/4$ [0,0,w]	$\bar{x},y,1/4$ [0,0,w]
		$x,\bar{y},3/4$ [0,0, \bar{w}]	$\bar{x},\bar{y},3/4$ [0,0, \bar{w}]
	4 d m'..	$0,y,z$ [0,v,w]	$0,y,\bar{z}+1/2$ [0, \bar{v} ,w]
		$0,\bar{y},\bar{z}$ [0, \bar{v} , \bar{w}]	$0,\bar{y},z+1/2$ [0,v, \bar{w}]
4 c 2..	$x,0,0$ [u,0,0]	$\bar{x},0,1/2$ [u,0,0]	
	$\bar{x},0,0$ [\bar{u} ,0,0]	$x,0,1/2$ [\bar{u} ,0,0]	
2 b m'2'm	$0,y,1/4$ [0,0,w]	$0,\bar{y},3/4$ [0,0, \bar{w}]	
2 a 2'/m..	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	

Symmetry of special projections

Along [001] 2mm1'	Along [100] p2mg $\mathbf{a}^* = \mathbf{c}$	Along [010] $p_{2a^*} 2m'm'$ $\mathbf{a}^* = \mathbf{c}/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

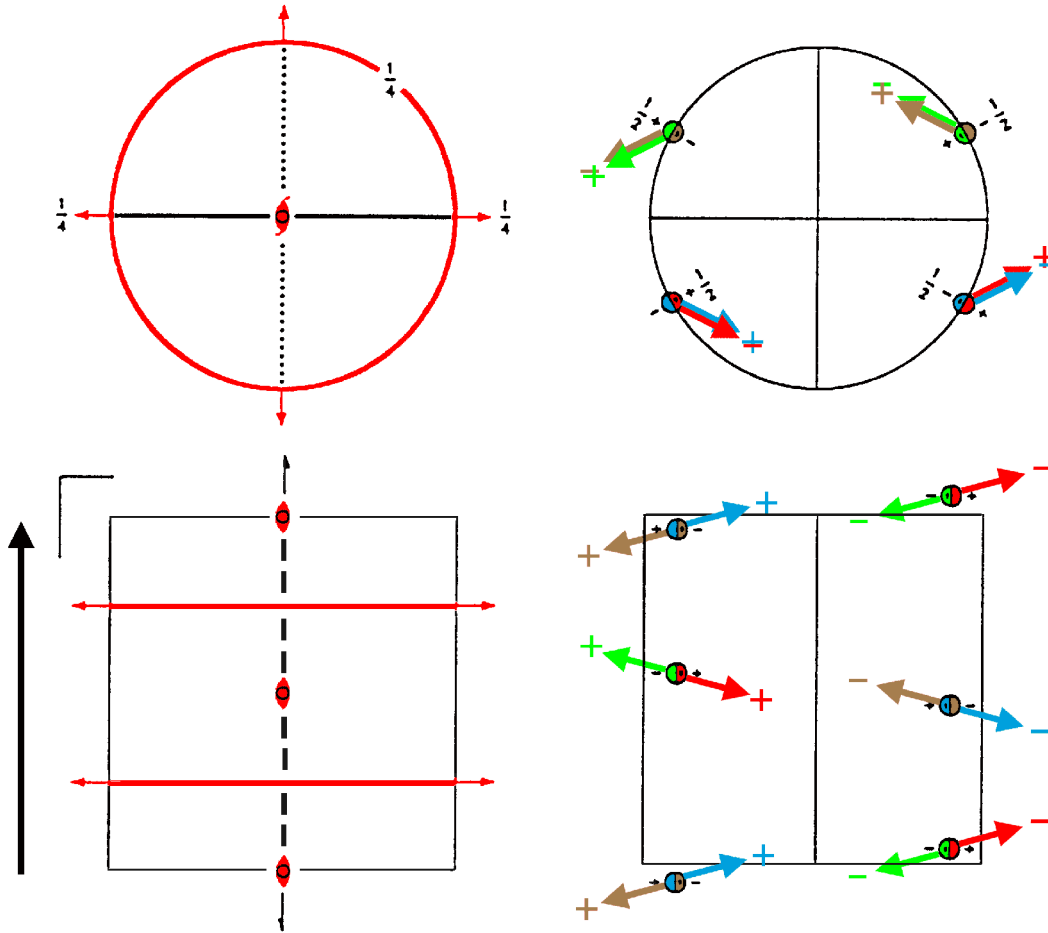
$pmcm'$

mmm'

Orthorhombic

No. 22.9.119

$p2'/m2'/c2_1/m'$



Origin at center ($2'/m$) at $2'/mc2_1$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|--|--------------------------------------|--|
| (1) 1
(1 0,0,0) | (2) $2'$ $0,y,1/4$
($2_y 0,0,1/2$)' | (3) $2'$ $x,0,0$
($2_x 0,0,0$)' | (4) 2 $(0,0,1/2)$ $0,0,z$
($2_z 0,0,1/2$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$)' | (6) c $(0,0,1/2)$ $x,0,z$
($m_y 0,0,1/2$) | (7) m $0,y,z$
($m_x 0,0,0$) | (8) m' $x,y,1/4$
($m_z 0,0,1/2$)' |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y,\bar{z}+1/2$ [u, \bar{v} ,w]	
	(3) x, \bar{y},\bar{z} [\bar{u} ,v,w]	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u} , \bar{v} ,w]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u} , \bar{v} , \bar{w}]	(6) x, $\bar{y},z+1/2$ [\bar{u} ,v, \bar{w}]	
	(7) \bar{x},y,z [u, \bar{v} , \bar{w}]	(8) x,y, $\bar{z}+1/2$ [u,v, \bar{w}]	
	4 e ..m'	x,y,1/4 [u,v,0]	$\bar{x},y,1/4$ [u, \bar{v} ,0]
		x, $\bar{y},3/4$ [\bar{u} ,v,0]	$\bar{x},\bar{y},3/4$ [\bar{u} , \bar{v} ,0]
	4 d m..	0,y,z [u,0,0]	0,y, $\bar{z}+1/2$ [u,0,0]
		0, \bar{y},\bar{z} [\bar{u} ,0,0]	0, $\bar{y},z+1/2$ [\bar{u} ,0,0]
4 c 2'..	x,0,0 [0,v,w]	$\bar{x},0,1/2$ [0, \bar{v} ,w]	
	$\bar{x},0,0$ [0, \bar{v} , \bar{w}]	x,0,1/2 [0,v, \bar{w}]	
2 b m2'm'	0,y,1/4 [u,0,0]	0, $\bar{y},3/4$ [\bar{u} ,0,0]	
2 a 2'/m..	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]	

Symmetry of special projections

Along [001] 2mm	Along [100] p2mg1'	Along [010] p _{2a*} 2mm
Origin at 0,0,z	a* = c Origin at x,0,0	a* = c/2 Origin at 0,y,0

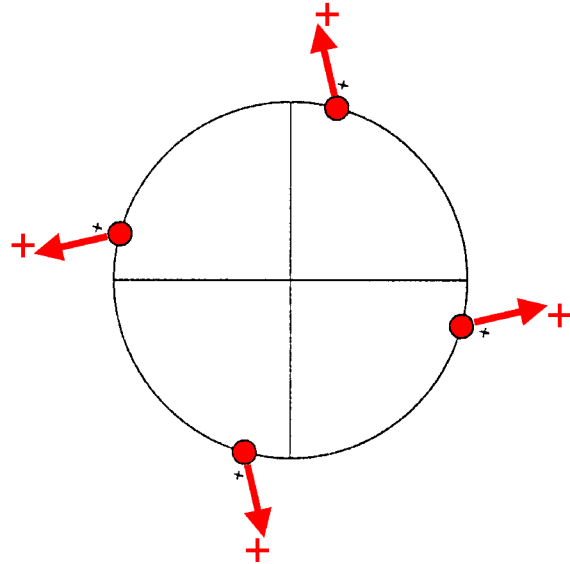
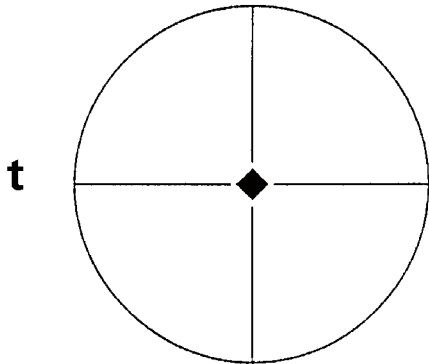
$p4$

4

Tetragonal

No. 23.1.120

$p4$



Origin on 4

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,0,z$
(2_z |0,0,0)

(3) 4^+ $0,0,z$
(4_z |0,0,0)

(4) 4^- $0,0,z$
(4_z^{-1} |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
4 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $\bar{y},x,z [\bar{v},u,w]$	(4) $y,\bar{x},z [v,\bar{u},w]$
	0,0,z [0,0,w]	
	1 a 4..	

Symmetry of special projections

Along [001] 4 Origin at 0,0,z	Along [100] $p11m'$ $a^* = c$ Origin at x,0,0	Along [110] $p11m'$ $a^* = c$ Origin at x,x,0
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$p41'$

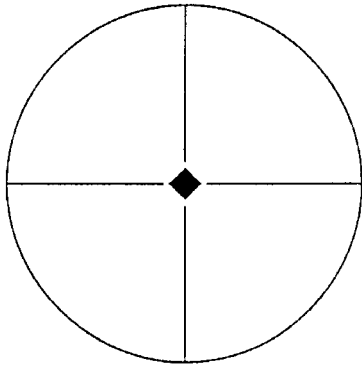
No. 23.2.121

$41'$

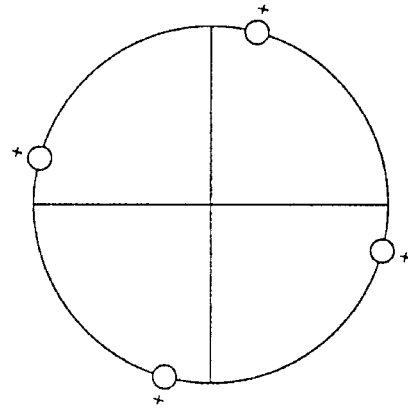
$p41'$

Tetragonal

t



1'



Origin on $41'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

- | | | | |
|--------------------|----------------------------------|--------------------------------------|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^+ $0,0,z$
(4_z 0,0,0) | (4) 4^- $0,0,z$
(4_z^{-1} 0,0,0) |
|--------------------|----------------------------------|--------------------------------------|---|

For $1' +$ set

- | | | | |
|------------------------|--------------------------------------|--|---|
| (1) $1'$
(1 0,0,0)' | (2) $2'$ $0,0,z$
(2_z 0,0,0)' | (3) $4^{+'}$ $0,0,z$
(4_z 0,0,0)' | (4) $4^{-'}$ $0,0,z$
(4_z^{-1} 0,0,0)' |
|------------------------|--------------------------------------|--|---|

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

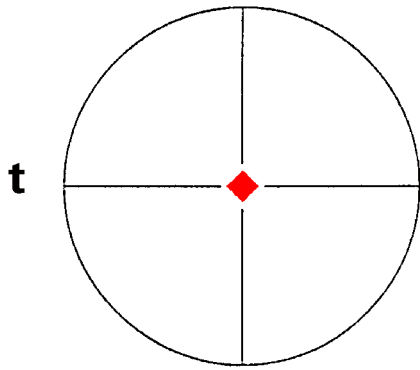
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1'+$
4 b $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $\bar{y},x,z [0,0,0]$	(4) $y,\bar{x},z [0,0,0]$
1 a $4..1'$	$0,0,z [0,0,0]$	

Symmetry of special projections

Along $[001] 41'$	Along $[100] p11m1'$	Along $[110] p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

$p4'$

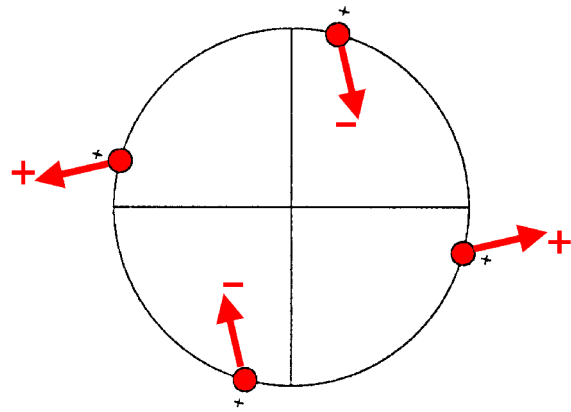
No. 23.3.122



$4'$

$p4'$

Tetragonal



Origin on $4'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2_{0,0,z}$
(2_z |0,0,0)

(3) $4^{+'}_{0,0,z}$
(4_z^{+} |0,0,0)'

(4) $4^{-'}_{0,0,z}$
(4_z^{-} |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		(1) x,y,z [u,v,w]
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]
4 b 1		
1 a 4'..	0,0,z [0,0,0]	

Symmetry of special projections

Along [001] 4'	Along [100] $\rho 11m'$ $a^* = c$	Along [110] $\rho 11m'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

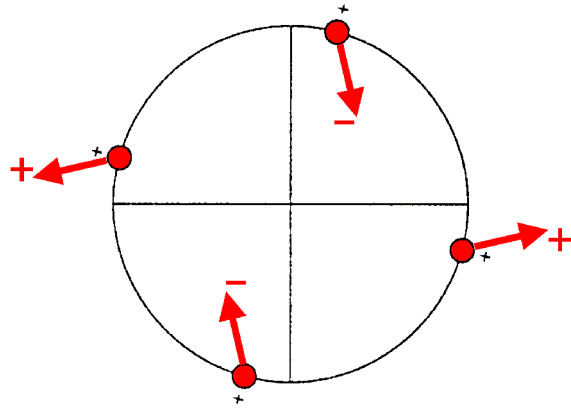
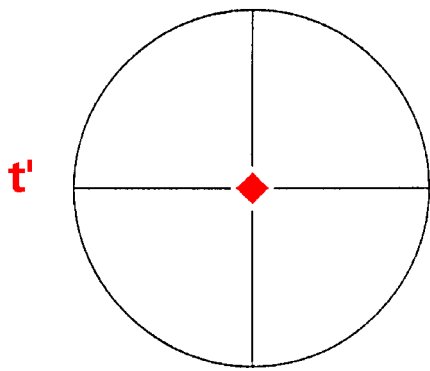
$p_{2c}4'$

$41'$

Tetragonal

No. 23.4.123

$p_{2c}4'$



Origin on $4'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1

$(1|0,0,0)$

(2) 2 $0,0,z$

$(2_z|0,0,0)$

(3) 4^{+} $0,0,z$

$(4_z|0,0,0)'$

(4) 4^{-} $0,0,z$

$(4_z^{-1}|0,0,0)'$

For $(0,0,1)'$ + set

(1) t' $(0,0,1)$

$(1|0,0,1)'$

(2) $2'$ $(0,0,1)$ $0,0,z$

$(2_z|0,0,1)'$

(3) 4^{+} $(0,0,1)$ $0,0,z$

$(4_z|0,0,1)$

(4) 4^{-} $(0,0,1)$ $0,0,z$

$(4_z^{-1}|0,0,1)$

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

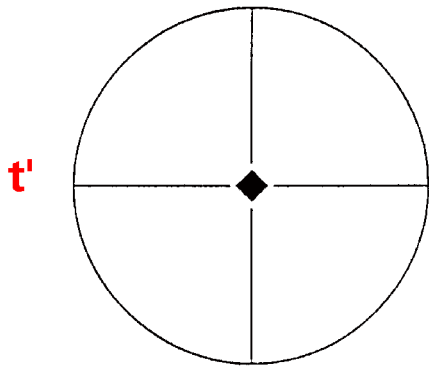
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
4 b 1	(1) x,y,z [u,v,w] (3) \bar{y},x,z [v,\bar{u},\bar{w}]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w] (4) y,\bar{x},z [\bar{v},u,\bar{w}]
1 a 4'..	0,0,z [0,0,0]	

Symmetry of special projections

Along [001] 41'	Along [100] $\rho_{2a^*} 11m'$ $a^* = c$	Along [110] $\rho_{2a^*} 11m'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

$p_{2c}4$

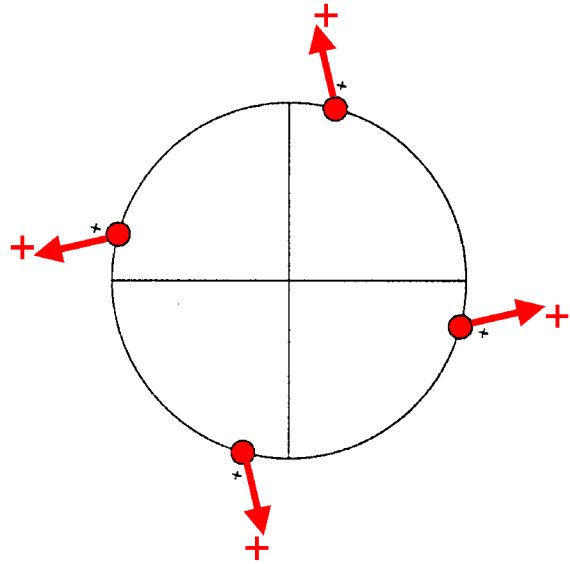
No. 23.5.124



$41'$

$p_{2c}4$

Tetragonal



Origin on 4

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0) +$ set

- | | | | |
|---------------|---------------------|-----------------------|--------------------------|
| (1) 1 | (2) $2 \quad 0,0,z$ | (3) $4^+ \quad 0,0,z$ | (4) $4^- \quad 0,0,z$ |
| (1 $0,0,0$) | (2_z $0,0,0$) | (4_z $0,0,0$) | (4_z^{-1} $0,0,0$) |

For $(0,0,1)'$ + set

- | | | | |
|------------------------|------------------------------------|--|--|
| (1) $t' \quad (0,0,1)$ | (2) $2' \quad (0,0,1) \quad 0,0,z$ | (3) $4^{+'} \quad (0,0,1) \quad 0,0,z$ | (4) $4^{-'} \quad (0,0,1) \quad 0,0,z$ |
| (1 $0,0,1$)' | (2_z $0,0,1$)' | (4_z $0,0,1$)' | (4_z^{-1} $0,0,1$)' |

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
4 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $\bar{y},x,z [\bar{v},u,w]$	(4) $y,\bar{x},z [v,\bar{u},w]$
1 a 4..	0,0,z [0,0,w]	

Symmetry of special projections

Along [001] 41'	Along [100] $p_{2a^*}11m'$ $a^* = c$	Along [110] $p_{2a^*}11m'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

$p4_1$

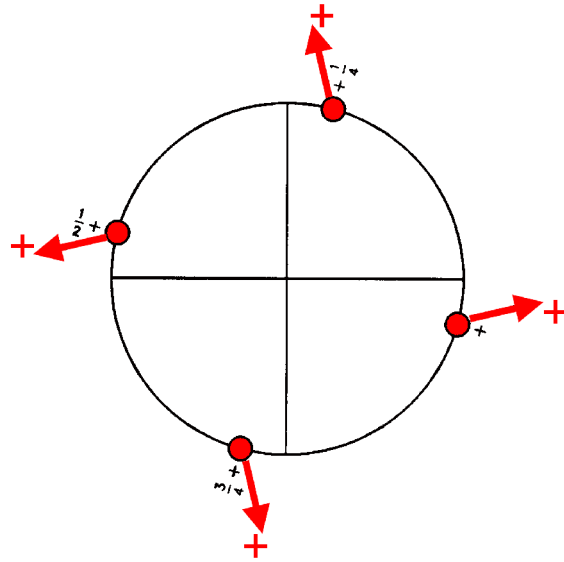
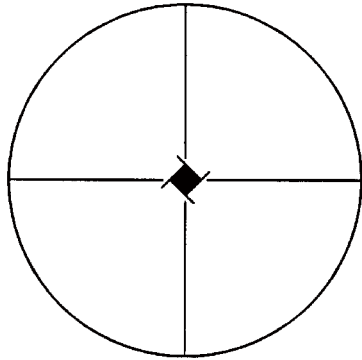
4

Tetragonal

No. 24.1.125

$p4_1$

t



Origin on 4_1

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,1/4) 0,0,z
(4 _z ⁺ 0,0,1/4) | (4) 4 ⁻ (0,0,3/4) 0,0,z
(4 _z ⁻ 0,0,3/4) |
|--------------------|--|--|--|

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	4 a 1	(1) x,y,z [u,v,w]
	(3) $\bar{y},x,z+1/4$ [\bar{v},u,w]	(4) $y,\bar{x},z+3/4$ [v,\bar{u},w]

Symmetry of special projections

Along [001] 4	Along [100] $p11g'$ $a^* = c$	Along [110] $p11g'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

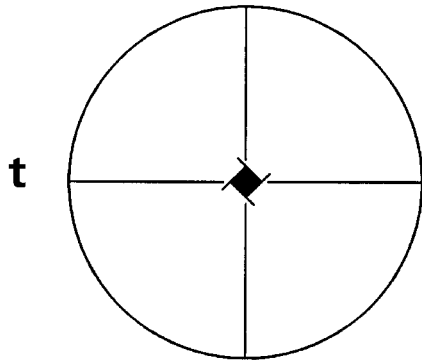
$p4_11'$

No. 24.2.126

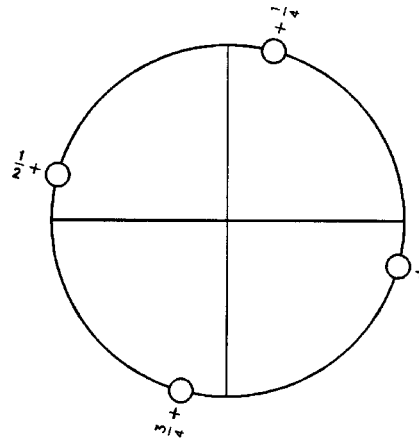
$41'$

$p4_11'$

Tetragonal



1'



Origin on $4_11'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- For $1 +$ set
- | | | | |
|--------------------|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,1/4) 0,0,z
(4 _z 0,0,1/4) | (4) 4 ⁻ (0,0,3/4) 0,0,z
(4 _z ⁻¹ 0,0,3/4) |
|--------------------|--|---|---|
- For $1' +$ set
- | | | | |
|----------------------|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' (0,0,1/2) 0,0,z
(2 _z 0,0,1/2)' | (3) 4 ⁺ ' (0,0,1/4) 0,0,z
(4 _z 0,0,1/4)' | (4) 4 ⁻ ' (0,0,3/4) 0,0,z
(4 _z ⁻¹ 0,0,3/4)' |
|----------------------|--|--|--|

Continued

No. 24.2.126

$p4_11'$

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

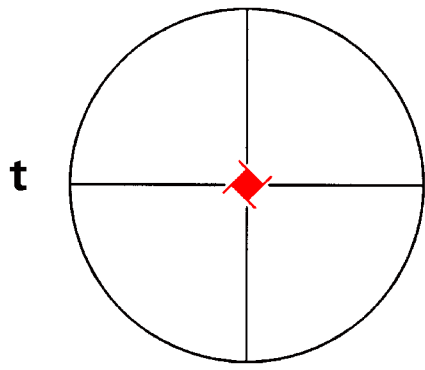
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	$1' +$
4 a $11'$	(1) x,y,z [0,0,0]	(2) $\bar{x},\bar{y},z+1/2$ [0,0,0]
	(3) $\bar{y},x,z+1/4$ [0,0,0]	(4) $y,\bar{x},z+3/4$ [0,0,0]

Symmetry of special projections

Along [001] $41'$	Along [100] $p11g1'$	Along [110] $p11g1'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

$p4_1'$

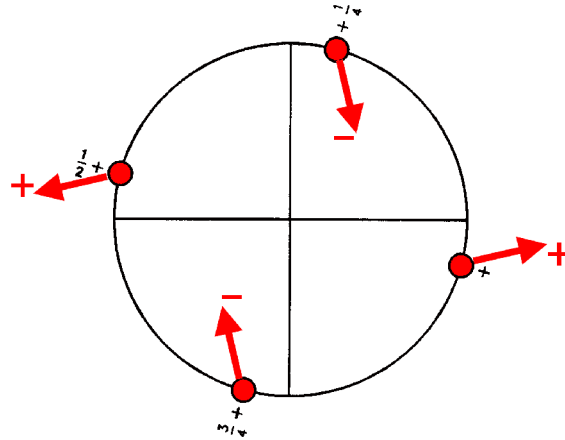
No. 24.3.127



$4'$

$p4_1'$

Tetragonal



Origin on $4_1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- | | | | |
|--------------------|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,1/4) 0,0,z
(4 _z ⁺ 0,0,1/4)' | (4) 4 ⁻ (0,0,3/4) 0,0,z
(4 _z ⁻ 0,0,3/4)' |
|--------------------|--|---|---|

Continued

No. 24.3.127

$p4_1'$

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 a 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]
	(3) $\bar{y},x,z+1/4$ [v,\bar{u},\bar{w}]	(4) $y,\bar{x},z+3/4$ [\bar{v},u,\bar{w}]

Symmetry of special projections

Along [001] $4'$	Along [100] $p11g'$	Along [110] $p11g'$
	$a^* = c$	$a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

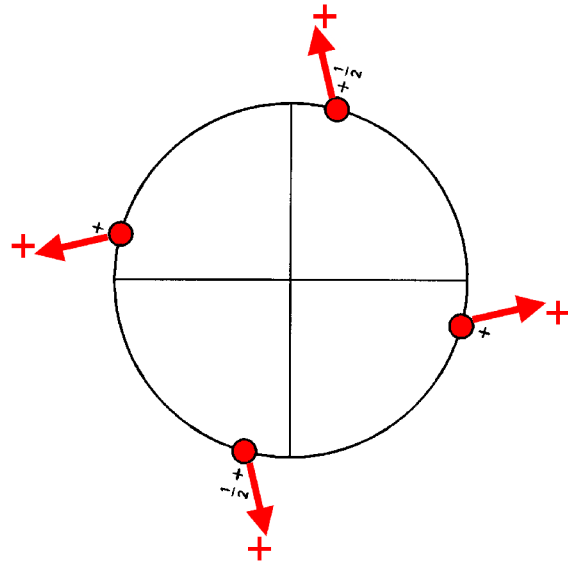
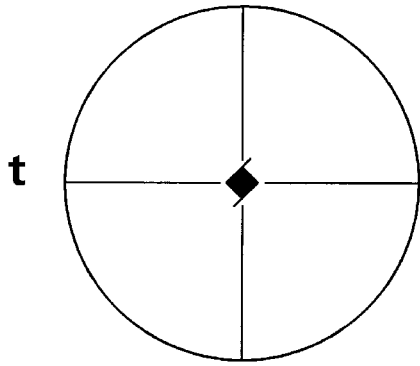
$p4_2$

4

Tetragonal

No. 25.1.128

$p4_2$



Origin on 2 on 4_2

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,0,z$
(2_z |0,0,0)

(3) 4^+ (0,0,1/2) $0,0,z$
(4_z |0,0,1/2)

(4) 4^- (0,0,1/2) $0,0,z$
(4_z^{-1} |0,0,1/2)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 b 1	(3) $\bar{y},x,z+1/2$ [\bar{v},u,w]	(4) $y,\bar{x},z+1/2$ [v,\bar{u},w]
2 a 2..	$0,0,z$ [$0,0,w$]	$0,0,z+1/2$ [$0,0,w$]

Symmetry of special projections

Along [001] 4	Along [100] $p11m'$ $a^* = c$	Along [110] $p11m'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

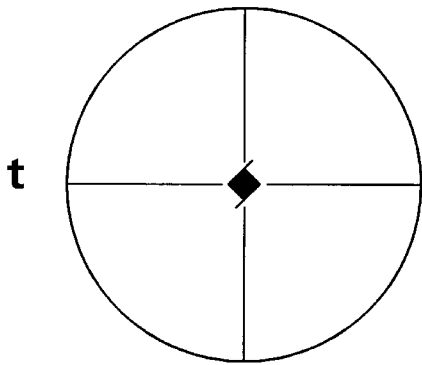
$p4_21'$

No. 25.2.129

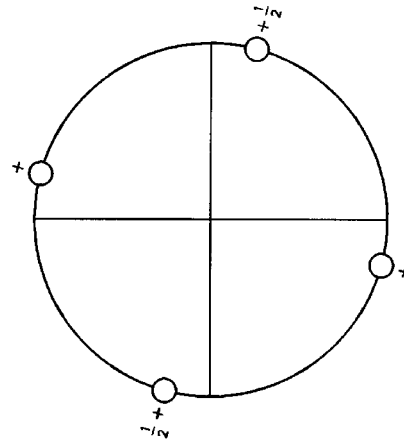
$41'$

$p4_21'$

Tetragonal



1'



Origin on $21'$ on $4_21'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- For $1 +$ set
- | | | | |
|--------------------|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2) | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2) |
|--------------------|--|---|---|
- For $1' +$ set
- | | | | |
|----------------------|--|---|---|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 4 ^{+'} (0,0,1/2) 0,0,z
(4 _z 0,0,1/2)' | (4) 4 ^{-'} (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2)' |
|----------------------|--|---|---|

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

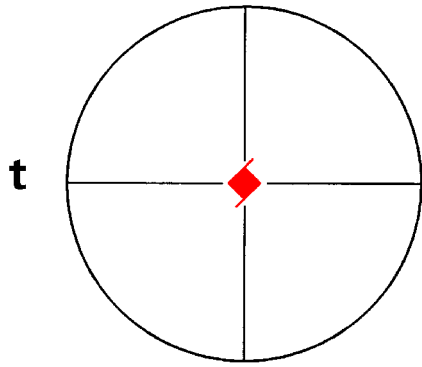
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 b $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $\bar{y},x,z+1/2 [0,0,0]$	(4) $y,\bar{x},z+1/2 [0,0,0]$
2 a $2..1'$	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$

Symmetry of special projections

Along $[001] 41'$	Along $[100] p11m1'$	Along $[110] p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

$p4_2'$

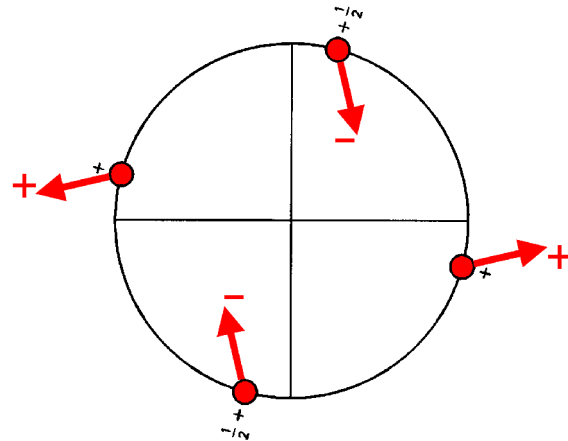
No. 25.3.130



$4'$

$p4_2'$

Tetragonal



Origin on 2 on $4_2'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,0,z$
(2_z |0,0,0)

(3) $4^{+1}(0,0,1/2) 0,0,z$
(4_z |0,0,1/2)'

(4) $4^{-1}(0,0,1/2) 0,0,z$
(4_z^{-1} |0,0,1/2)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		(1) x,y,z [u,v,w]
	(3) $\bar{y},x,z+1/2$ [v,\bar{u},\bar{w}]	(4) $y,\bar{x},z+1/2$ [\bar{v},u,\bar{w}]
4 b 1		
2 a 2..	$0,0,z$ [$0,0,w$]	$0,0,z+1/2$ [$0,0,\bar{w}$]

Symmetry of special projections

Along [001] $4'$	Along [100] $p11m'$	Along [110] $p11m'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

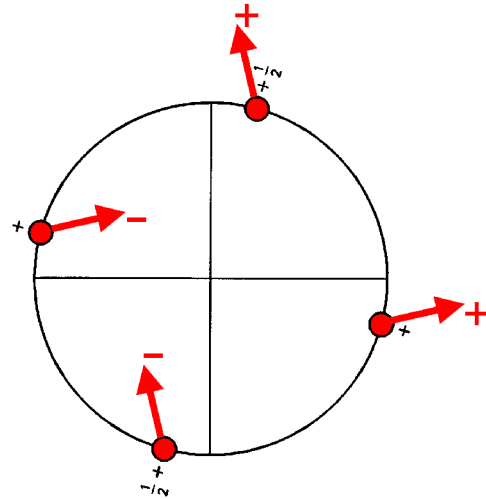
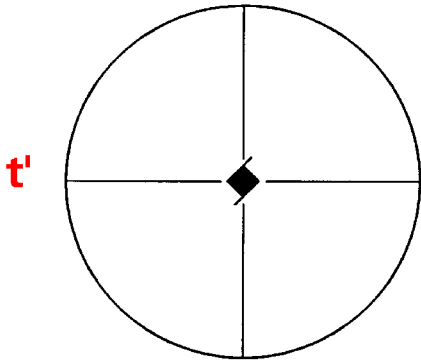
$p_{2c}4_2$

$41'$

Tetragonal

No. 25.4.131

$p_{2c}4_2$



Origin on $2'$ on 4_2

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|---------------|----------------------|-------------------------------|-------------------------------|
| (1) 1 | (2) $2'$ $0,0,z$ | (3) 4^+ $(0,0,1/2)$ $0,0,z$ | (4) 4^- $(0,0,1/2)$ $0,0,z$ |
| (1 $0,0,0$) | (2_z $0,0,0$)' | (4_z $0,0,1/2$) | (4_z^{-1} $0,0,1/2$)' |

For $(0,0,1)$ + set

- | | | | |
|--------------------|---------------------------|---------------------------------|---------------------------------|
| (1) t' $(0,0,1)$ | (2) 2 $(0,0,1)$ $0,0,z$ | (3) 4^{+} $(0,0,3/2)$ $0,0,z$ | (4) 4^{-} $(0,0,3/2)$ $0,0,z$ |
| (1 $0,0,1$)' | (2_z $0,0,1$) | (4_z $0,0,3/2$)' | (4_z^{-1} $0,0,3/2$) |

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
4 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$
	(3) $\bar{y},x,z+1/2 [\bar{v},u,w]$	(4) $y,\bar{x},z+1/2 [v,u,\bar{w}]$
2 a 2'..	$0,0,z [u,v,0]$	$0,0,z+1/2 [\bar{v},u,0]$

Symmetry of special projections

Along [001] $41'$	Along [100] $\rho_{2a^*} 11m$ $a^* = c$	Along [110] $\rho_{2a^*} 11m$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

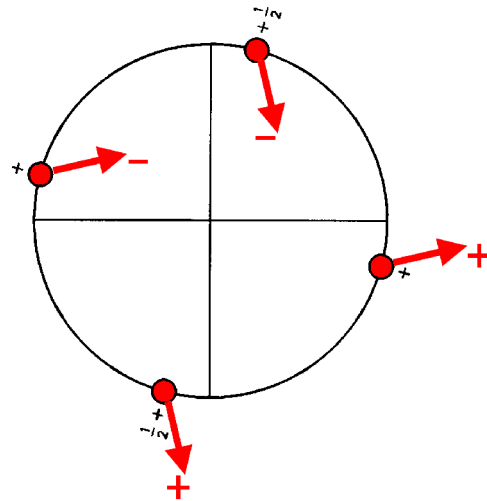
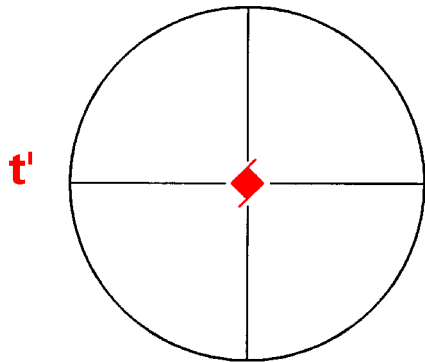
$p_{2c}4_2'$

$41'$

Tetragonal

No. 25.5.132

$p_{2c}4_2'$



Origin on $2'$ on $4_2'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|-------------|------------------|---------------------------------|---------------------------------|
| (1) 1 | (2) $2'$ $0,0,z$ | (3) 4^{+} $(0,0,1/2)$ $0,0,z$ | (4) 4^{-} $(0,0,1/2)$ $0,0,z$ |
| $(1 0,0,0)$ | $(2_z 0,0,0)'$ | $(4_z 0,0,1/2)'$ | $(4_z^{-1} 0,0,1/2)$ |

For $(0,0,1)'$ + set

- | | | | |
|--------------------|---------------------------|---------------------------------|---------------------------------|
| (1) t' $(0,0,1)$ | (2) 2 $(0,0,1)$ $0,0,z$ | (3) 4^{+} $(0,0,3/2)$ $0,0,z$ | (4) 4^{-} $(0,0,3/2)$ $0,0,z$ |
| $(1 0,0,1)'$ | $(2_z 0,0,1)$ | $(4_z 0,0,3/2)$ | $(4_z^{-1} 0,0,3/2)'$ |

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
4 b 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]
	(3) $\bar{y},x,z+1/2$ [v, \bar{u},\bar{w}]	(4) $y,\bar{x},z+1/2$ [v, \bar{u},w]
2 a 2'..	0,0,z [u,v,0]	0,0,z+1/2 [v, $\bar{u},0$]

Symmetry of special projections

Along [001] $41'$	Along [100] $P_{2a^*} 11m$ $a^* = c$	Along [110] $P_{2a^*} 11m$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

$p4_3$

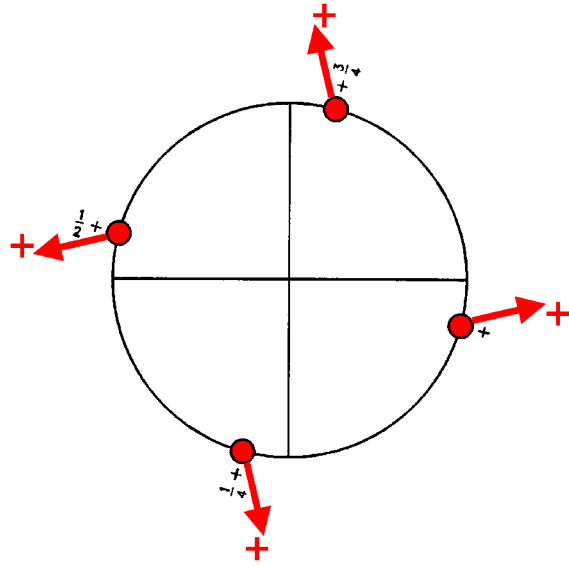
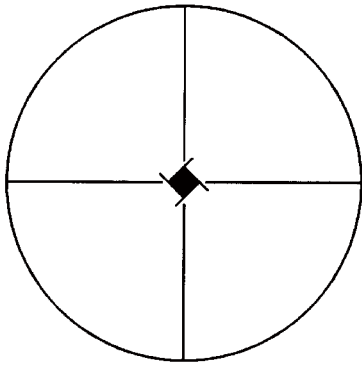
4

Tetragonal

No. 26.1.133

$p4_3$

t



Origin on 4_3

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,3/4) 0,0,z
(4 _z ⁺ 0,0,3/4) | (4) 4 ⁻ (0,0,1/4) 0,0,z
(4 _z ⁻ 0,0,1/4) |
|--------------------|--|--|--|

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	4 a 1	(1) x,y,z [u,v,\bar{w}]
	(3) $\bar{y},x,z+3/4$ [\bar{v},u,w]	(4) $y,\bar{x},z+1/4$ [v,\bar{u},w]

Symmetry of special projections

Along [001] 4	Along [100] $p11g'$ $a^* = c$	Along [110] $p11g'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

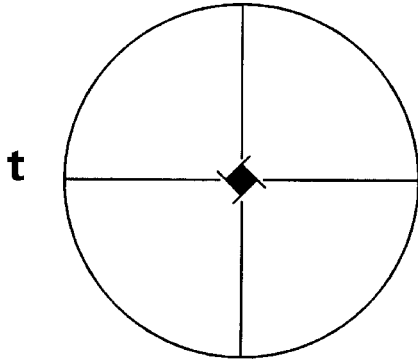
$p4_31'$

No. 26.2.134

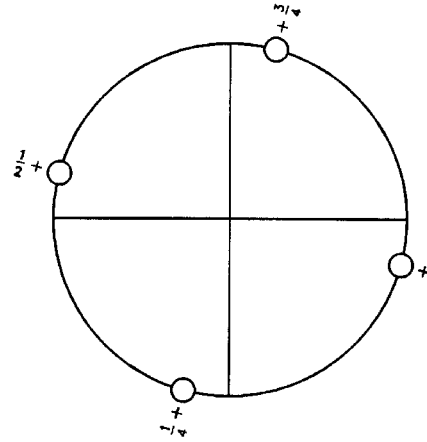
$41'$

$p4_31'$

Tetragonal



1'



Origin on $4_31'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

- | | | | |
|--------------------|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,3/4) 0,0,z
(4 _z 0,0,3/4) | (4) 4 ⁻ (0,0,1/4) 0,0,z
(4 _z ⁻¹ 0,0,1/4) |
|--------------------|--|---|---|

For $1' +$ set

- | | | | |
|----------------------|--|---|---|
| (1) 1'
(1 0,0,0)' | (2) 2' (0,0,1/2) 0,0,z
(2 _z 0,0,1/2)' | (3) 4 ^{+'} (0,0,3/4) 0,0,z
(4 _z 0,0,3/4)' | (4) 4 ^{'-} (0,0,1/4) 0,0,z
(4 _z ⁻¹ 0,0,1/4)' |
|----------------------|--|---|---|

Continued

No. 26.2.134

$p4_31'$

Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

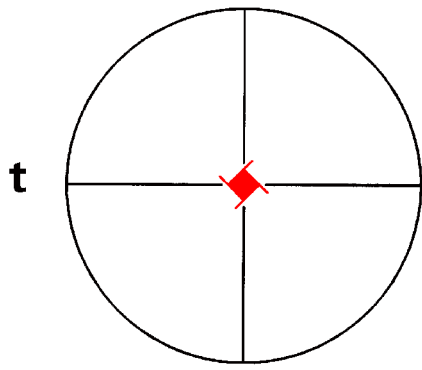
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	$1' +$
4 a $11'$	(1) x,y,z [0,0,0]	(2) $\bar{x},\bar{y},z+1/2$ [0,0,0]
	(3) $\bar{y},x,z+3/4$ [0,0,0]	(4) $y,\bar{x},z+1/4$ [0,0,0]

Symmetry of special projections

Along [001] $41'$	Along [100] $p11g1'$	Along [110] $p11g1'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

$p4_3'$

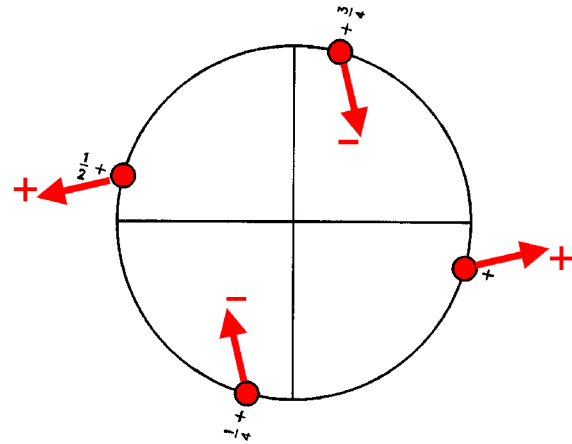
No. 26.3.135



$4'$

$p4_3'$

Tetragonal



Origin on $4_3'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2 (0,0,1/2) 0,0,z
(2_z|0,0,1/2)
- (3) 4⁺ (0,0,3/4) 0,0,z
(4_z|0,0,3/4)'
- (4) 4⁻ (0,0,1/4) 0,0,z
(4_z⁻¹|0,0,1/4)'

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

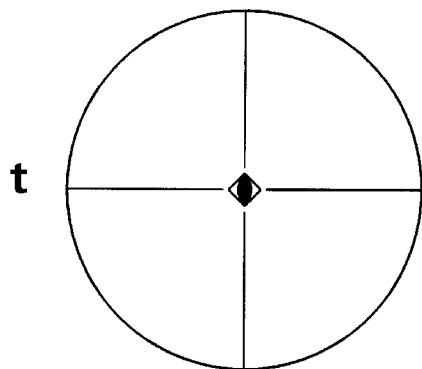
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	4 a 1	(1) x,y,z [u,v,w]
	(3) $\bar{y},x,z+3/4$ [v,\bar{u},\bar{w}]	(4) $y,\bar{x},z+1/4$ [\bar{v},u,\bar{w}]

Symmetry of special projections

Along [001] $4'$	Along [100] $p11g'$	Along [110] $p11g'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

$p\bar{4}$

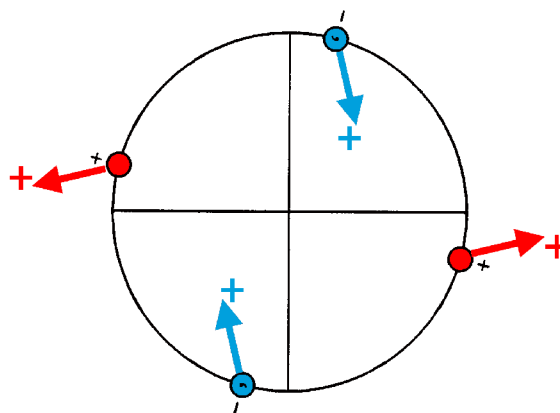
No. 27.1.136



$\bar{4}$

$p\bar{4}$

Tetragonal



Origin at $\bar{4}$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,0,z$
(2_z |0,0,0)

(3) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ |0,0,0)

(4) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 d 1	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]
2 c 2..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]
1 b $\bar{4}$..	$0,0,1/2$ [$0,0,w$]	
1 a $\bar{4}$..	$0,0,0$ [$0,0,w$]	

Symmetry of special projections

Along [001] 4'	Along [100] $p11m'$ $a^* = c$	Along [110] $p11m'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

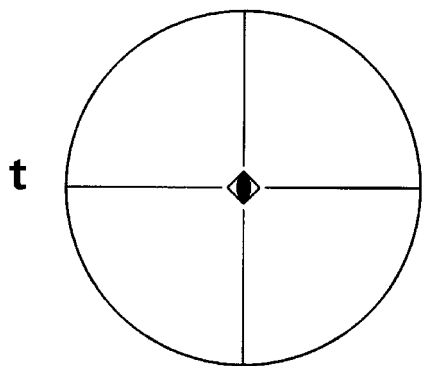
$p\bar{4}1'$

No. 27.2.137

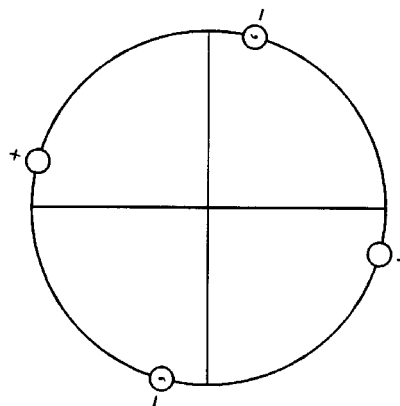
$\bar{4}1'$

$p\bar{4}1'$

Tetragonal



1'



Origin at $\bar{4}1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For 1 + set

- | | | | |
|--------------------|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
|--------------------|--|---|--|

For 1' + set

- | | | | |
|----------------------|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) $\bar{4}^{+'}$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^{-'}$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
|----------------------|--|---|--|

Continued

No. 27.2.137

 $p\bar{4}1'$ Generators selected (1); $t(0,0,1)$; (2); (3); $1'$

Positions

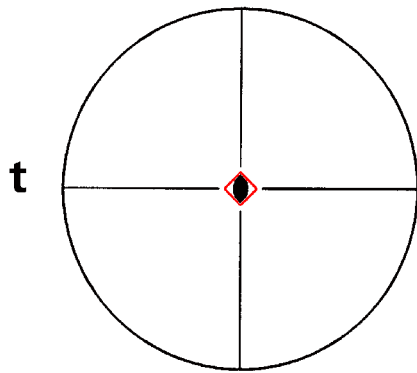
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 d $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $y,\bar{x},\bar{z} [0,0,0]$	(4) $\bar{y},x,\bar{z} [0,0,0]$
2 c $2..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$
1 b $\bar{4}..1'$	$0,0,1/2 [0,0,0]$	
1 a $\bar{4}..1'$	$0,0,0 [0,0,0]$	

Symmetry of special projections

Along $[001] 41'$	Along $[100] p11m1'$	Along $[110] p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

$\overline{p4}$

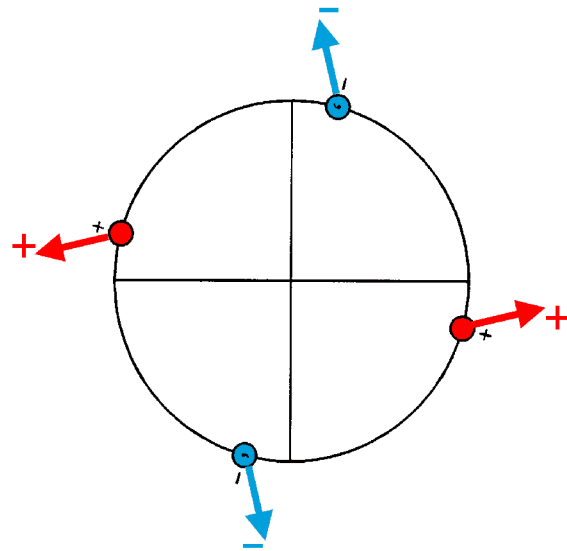
No. 27.3.138



$\overline{4}$

Tetragonal

$\overline{p4}$



Origin at $\overline{4}$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,0,z$
(2_z |0,0,0)

(3) $\overline{4}^{+}$ $0,0,z; 0,0,0$
($\overline{4}_z$ |0,0,0)'

(4) $\overline{4}^{-}$ $0,0,z; 0,0,0$
($\overline{4}_z^{-1}$ |0,0,0)'

Continued

No. 27.3.138

 $p\bar{4}'$ Generators selected (1); $t(0,0,1)$; (2); (3)

Positions

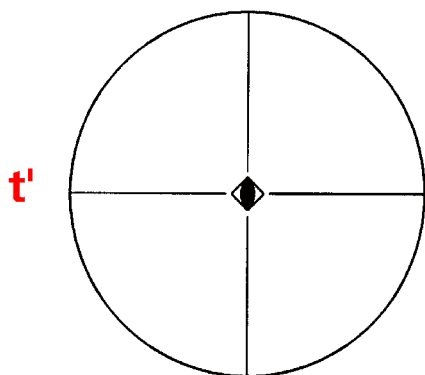
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		(1) x,y,z [u,v,w]
	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
4 d 1	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]
2 c 2..	$0,0,1/2$ [$0,0,0$]	
1 b $\bar{4}'..$	$0,0,0$ [$0,0,0$]	
1 a $\bar{4}'..$	$0,0,0$ [$0,0,0$]	

Symmetry of special projections

Along [001] 4	Along [100] $p11m'$ $a^* = c$	Along [110] $p11m'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

$\rho_{2c}\bar{4}$

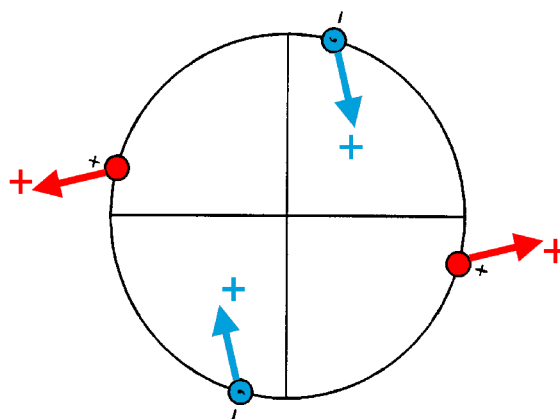
No. 27.4.139



$\bar{4}1'$

$\rho_{2c}\bar{4}$

Tetragonal



Origin at $\bar{4}$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|---------------|---------------------|------------------------------------|------------------------------------|
| (1) 1 | (2) $2 \quad 0,0,z$ | (3) $\bar{4}^+ \quad 0,0,z; 0,0,0$ | (4) $\bar{4}^- \quad 0,0,z; 0,0,0$ |
| (1 $0,0,0$) | (2_z $0,0,0$) | ($\bar{4}_z$ $0,0,0$) | ($\bar{4}_z^{-1}$ $0,0,0$) |

For $(0,0,1)'$ + set

- | | | | |
|------------------------|------------------------------------|---|---|
| (1) $t' \quad (0,0,1)$ | (2) $2' \quad (0,0,1) \quad 0,0,z$ | (3) $\bar{4}^{+'} \quad 0,0,z; 0,0,1/2$ | (4) $\bar{4}^{-'} \quad 0,0,z; 0,0,1/2$ |
| (1 $0,0,1$)' | (2_z $0,0,1$)' | ($\bar{4}_z$ $0,0,1$)' | ($\bar{4}_z^{-1}$ $0,0,1$)' |

Generators selected (1); $t(0,0,1)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
4 d 1	(1) x,y,z [u,v,w] (3) y,\bar{x},\bar{z} [\bar{v},u,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w] (4) \bar{y},x,\bar{z} [v, \bar{u},w]
2 c 2..	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]
1 b $\bar{4}$..	0,0,1/2 [0,0,0]	
1 a $\bar{4}$..	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] 41'	Along [100] $p11m'$ $a^* = c$	Along [110] $p11m'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

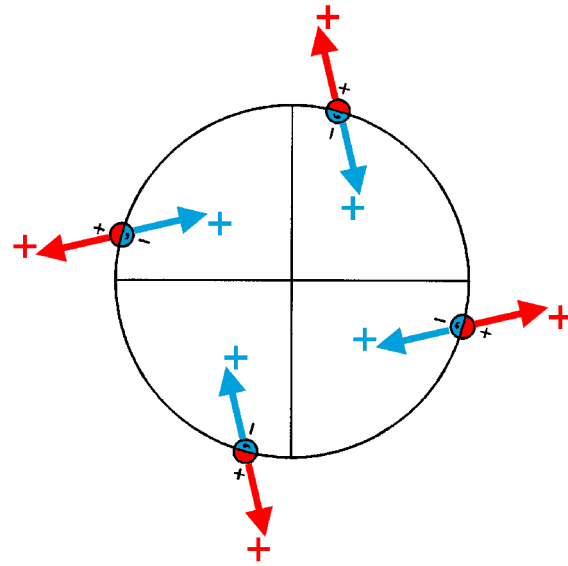
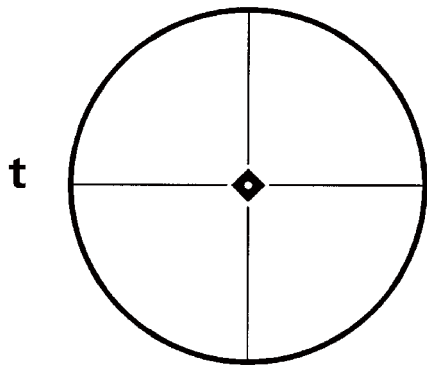
$p4/m$

No. 28.1.140

$4/m$

$p4/m$

Tetragonal



Origin at center ($4/m$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|--------------------------------------|---|---|
| (1) 1
(1 0,0,0) | (2) 2_{z} 0,0,z
(2_z 0,0,0) | (3) 4^+ 0,0,z
(4_z^+ 0,0,0) | (4) 4^- 0,0,z
(4_z^- 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m_z x,y,0
(m_z 0,0,0) | (7) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0) | (8) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y, \bar{z} [\bar{u},\bar{v},\bar{w}]	
	(7) y, \bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(8) \bar{y},x,\bar{z} [v, \bar{u},\bar{w}]	
	4 e m..	x,y,1/2 [0,0,w]	$\bar{x},\bar{y},1/2$ [0,0,w]
		$\bar{y},x,1/2$ [0,0,w]	y, $\bar{x},1/2$ [0,0,w]
	4 d m..	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]
		$\bar{y},x,0$ [0,0,w]	y, $\bar{x},0$ [0,0,w]
2 c 4..	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]	
1 b 4/m..	0,0,1/2 [0,0,w]		
1 a 4/m..	0,0,0 [0,0,w]		

Symmetry of special projections

Along [001] 41'	Along [100] p2'mm'	Along [110] p2'mm'
Origin at 0,0,z	a* = c Origin at x,0,0	a* = c Origin at x,x,0

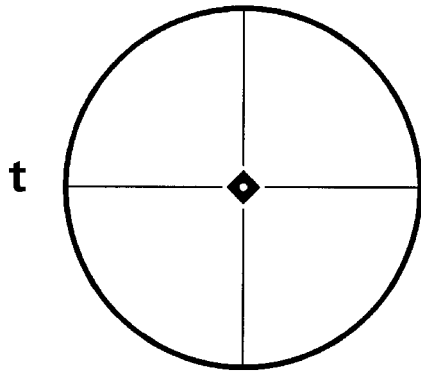
$p4/m1'$

$4/m1'$

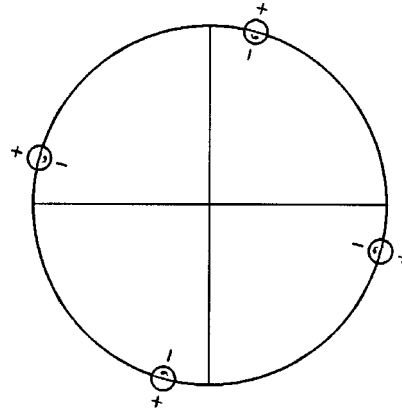
Tetragonal

No. 28.2.141

$p4/m1'$



1'



Origin at center ($4/m1'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

- | | | | |
|--|------------------------------------|---|--|
| (1) 1
($1 0,0,0$) | (2) 2 $0,0,z$
($2_z 0,0,0$) | (3) 4^+ $0,0,z$
($4_z 0,0,0$) | (4) 4^- $0,0,z$
($4_z^{-1} 0,0,0$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (6) m $x,y,0$
($m_z 0,0,0$) | (7) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z 0,0,0$) | (8) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1} 0,0,0$) |

For $1' +$ set

- | | | | |
|--|--------------------------------------|---|--|
| (1) $1'$
($1 0,0,0$)' | (2) $2'$ $0,0,z$
($2_z 0,0,0$)' | (3) $4^{+'}$ $0,0,z$
($4_z 0,0,0$)' | (4) $4^{-'}$ $0,0,z$
($4_z^{-1} 0,0,0$)' |
| (5) $\bar{1}'$ $0,0,0$
($\bar{1} 0,0,0$)' | (6) m' $x,y,0$
($m_z 0,0,0$)' | (7) $\bar{4}^{+'}$ $0,0,z; 0,0,0$
($\bar{4}_z 0,0,0$)' | (8) $\bar{4}^{-'}$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1} 0,0,0$)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); $1'$

Positions

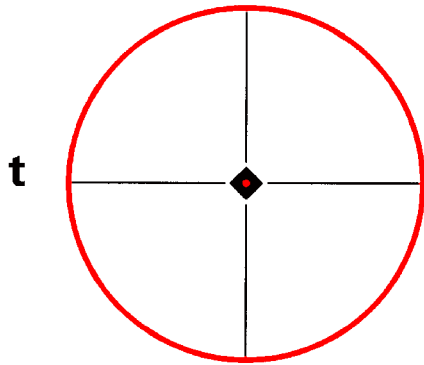
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1' +$
8 f $11'$	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]
	(3) \bar{y},x,z [0,0,0]	(4) y,\bar{x},z [0,0,0]
	(5) \bar{x},\bar{y},\bar{z} [0,0,0]	(6) x,y,\bar{z} [0,0,0]
	(7) y,\bar{x},\bar{z} [0,0,0]	(8) \bar{y},x,\bar{z} [0,0,0]
4 e $m..1'$	$x,y,1/2$ [0,0,0]	$\bar{x},\bar{y},1/2$ [0,0,0]
	$\bar{y},x,1/2$ [0,0,0]	$y,\bar{x},1/2$ [0,0,0]
4 d $m..1'$	$x,y,0$ [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]
	$\bar{y},x,0$ [0,0,0]	$y,\bar{x},0$ [0,0,0]
2 c $4..1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]
1 b $4/m..1'$	$0,0,1/2$ [0,0,0]	
1 a $4/m..1'$	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] $41'$	Along [100] $p2mm1'$	Along [110] $p2mm1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

$p4/m'$

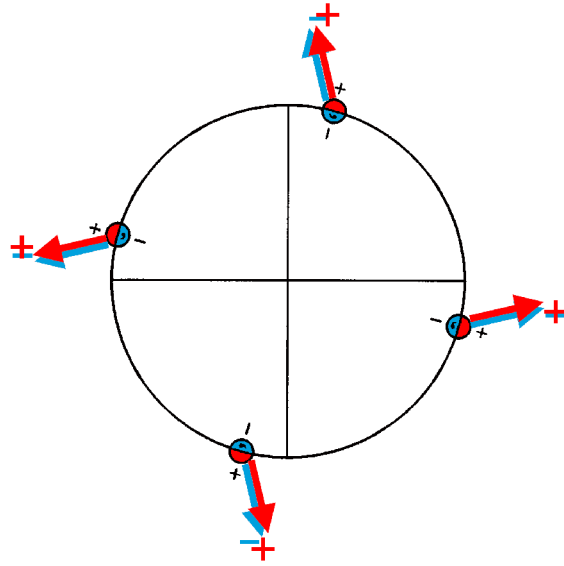
No. 28.3.142



$4/m'$

$p4/m'$

Tetragonal



Origin at center ($4/m'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2_{0,0,z}$
(2_z |0,0,0)

(3) 4^+ 0,0,z
(4_z |0,0,0)

(4) 4^- 0,0,z
(4_z^{-1} |0,0,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m' x,y,0
(m_z |0,0,0)

(7) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ |0,0,0)

(8) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

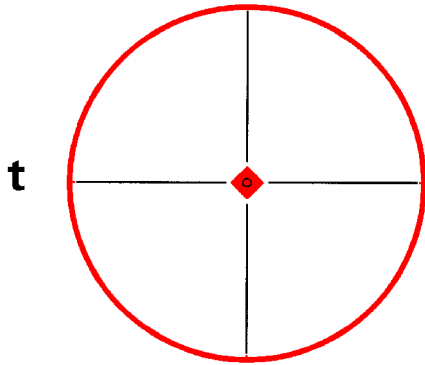
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [u,v, \bar{w}]	
	(7) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(8) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]	
	4 e $m'..$	$x,y,1/2$ [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]
		$\bar{y},x,1/2$ [$\bar{v},u,0$]	$y,\bar{x},1/2$ [$v,\bar{u},0$]
	4 d $m'..$	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]
		$\bar{y},x,0$ [$\bar{v},u,0$]	$y,\bar{x},0$ [$v,\bar{u},0$]
2 c 4..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]	
1 b $4/m'..$	$0,0,1/2$ [0,0,0]		
1 a $4/m'..$	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] 4	Along [100] $p2m'm'$ $a^* = c$	Along [110] $p2m'm'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

$p4'/m'$

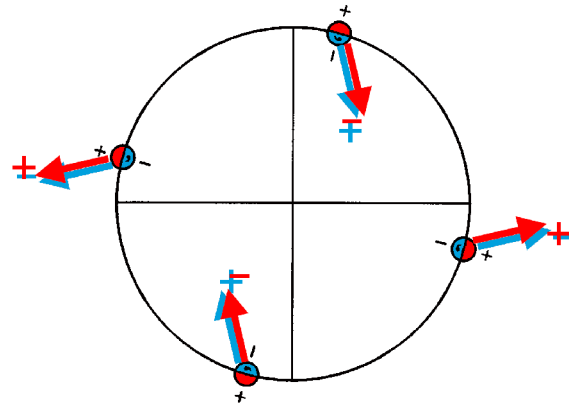
No. 28.4.143



$4'/m'$

$p4'/m'$

Tetragonal



Origin at center ($4'/m'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|---|--------------------------------------|---|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^{+} $0,0,z$
(4_z 0,0,0)' | (4) 4^{-} $0,0,z$
(4_z^{-1} 0,0,0)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (6) m' $x,y,0$
(m_z 0,0,0)' | (7) $\bar{4}^{+}$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0) | (8) $\bar{4}^{-}$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [u,v, \bar{w}]	
	(7) y,\bar{x},\bar{z} [\bar{v},u,w]	(8) \bar{y},x,\bar{z} [v,\bar{u},w]	
	4 e $m'..$	$x,y,1/2$ [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]
		$\bar{y},x,1/2$ [$v,\bar{u},0$]	$y,\bar{x},1/2$ [$\bar{v},u,0$]
	4 d $m'..$	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]
		$\bar{y},x,0$ [$v,\bar{u},0$]	$y,\bar{x},0$ [$\bar{v},u,0$]
2 c $4'..$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
1 b $4'/m'..$	$0,0,1/2$ [0,0,0]		
1 a $4'/m'..$	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $4'$	Along [100] $p2m'm'$	Along [110] $p2m'm'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

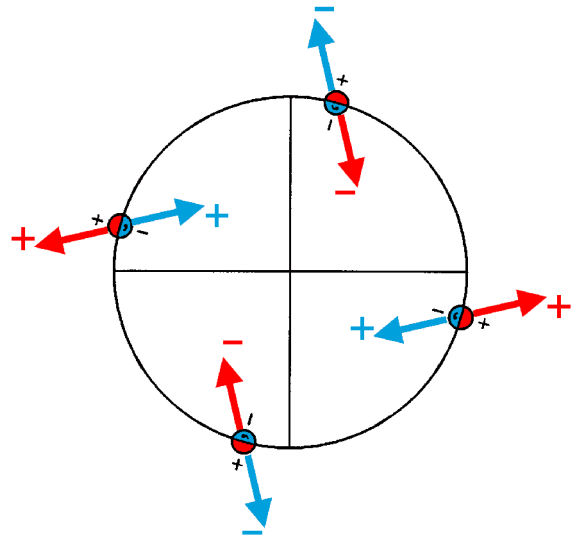
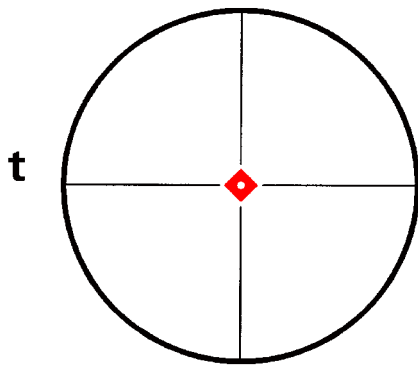
$p4'/m$

No. 28.5.144

$4'/m$

$p4'/m$

Tetragonal



Origin at center ($4'/m$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|----------------------------------|--|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^{+} $0,0,z$
(4_z 0,0,0)' | (4) 4^{-} $0,0,z$
(4_z^{-1} 0,0,0)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m $x,y,0$
(m_z 0,0,0) | (7) $\bar{4}^{+}$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0)' | (8) $\bar{4}^{-}$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y,\bar{z} [\bar{u},\bar{v},w]	
	(7) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(8) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]	
	4 e m..	$x,y,1/2$ [$0,0,w$]	$\bar{x},\bar{y},1/2$ [$0,0,w$]
		$\bar{y},x,1/2$ [$0,0,\bar{w}$]	$y,\bar{x},1/2$ [$0,0,\bar{w}$]
	4 d m..	$x,y,0$ [$0,0,w$]	$\bar{x},\bar{y},0$ [$0,0,w$]
		$\bar{y},x,0$ [$0,0,\bar{w}$]	$y,\bar{x},0$ [$0,0,\bar{w}$]
2 c 4'..	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	
1 b 4'/m..	$0,0,1/2$ [$0,0,0$]		
1 a 4'/m..	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $41'$	Along [100] $p2'mm'$ $a^* = c$	Along [110] $p2'mm'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

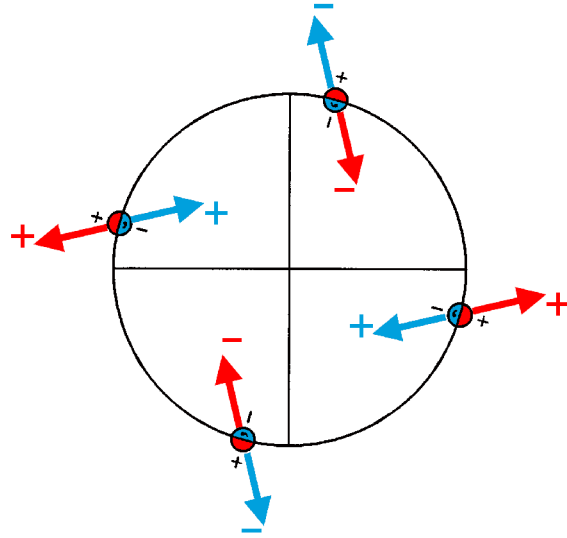
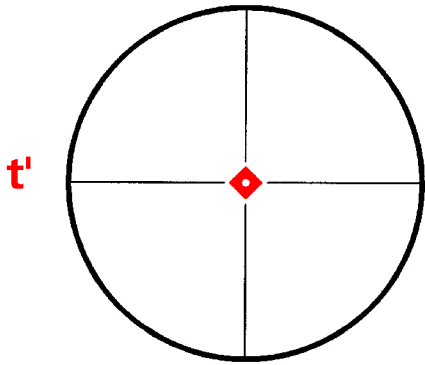
$p_{2c}4'/m$

No. 28.6.145

$4/m1'$

$p_{2c}4'/m$

Tetragonal



Origin at center ($4'/m$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)^+$ set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 4 ⁺ $0,0,z$
(4 _z 0,0,0)' | (4) 4 ⁻ $0,0,z$
(4 _z ⁻¹ 0,0,0)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m $x,y,0$
(m _z 0,0,0) | (7) $\bar{4}^{+}$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0)' | (8) $\bar{4}^{-}$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0)' |

For $(0,0,1)'$ set

- | | | | |
|--|---|--|--|
| (1) t' $(0,0,1)$
(1 0,0,1)' | (2) 2' $(0,0,1) 0,0,z$
(2 _z ' 0,0,1)' | (3) 4 ⁺ $(0,0,1) 0,0,z$
(4 _z ' 0,0,1) | (4) 4 ⁻ $(0,0,1) 0,0,z$
(4 _z ⁻¹ ' 0,0,1) |
| (5) $\bar{1}$ ' $0,0,1/2$
($\bar{1}$ ' 0,0,1)' | (6) m' $x,y,1/2$
(m _z ' 0,0,1)' | (7) $\bar{4}^{+}$ ' $0,0,z; 0,0,1/2$
($\bar{4}_z$ ' 0,0,1) | (8) $\bar{4}^{-}$ ' $0,0,z; 0,0,1/2$
($\bar{4}_z^{-1}$ ' 0,0,1) |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
8 f 1	(1) x,y,z [u,v,w] (3) \bar{y},x,z [v, \bar{u} , \bar{w}] (5) \bar{x},\bar{y},\bar{z} [u,v,w] (7) y,\bar{x},\bar{z} [v, \bar{u} , \bar{w}]	(2) \bar{x},\bar{y},z [\bar{u} , \bar{v} ,w] (4) y,\bar{x},z [\bar{v} ,u, \bar{w}] (6) x,y,\bar{z} [\bar{u} , \bar{v} ,w] (8) \bar{y},x,\bar{z} [\bar{v} ,u, \bar{w}]
4 e m'..	$x,y,1/2$ [u,v,0] $\bar{y},x,1/2$ [v, \bar{u} ,0]	$\bar{x},\bar{y},1/2$ [\bar{u} , \bar{v} ,0] $y,\bar{x},1/2$ [\bar{v} ,u,0]
4 d m..	$x,y,0$ [0,0,w] $\bar{y},x,0$ [0,0, \bar{w}]	$\bar{x},\bar{y},0$ [0,0,w] $y,\bar{x},0$ [0,0, \bar{w}]
2 c 4'..	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]
1 b 4'/m'..	$0,0,1/2$ [0,0,0]	
1 a 4'/m..	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] $41'$	Along [100] $p_{2a^*} 2'mm'$ $a^* = c$	Along [110] $p_{2a^*} 2'mm'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

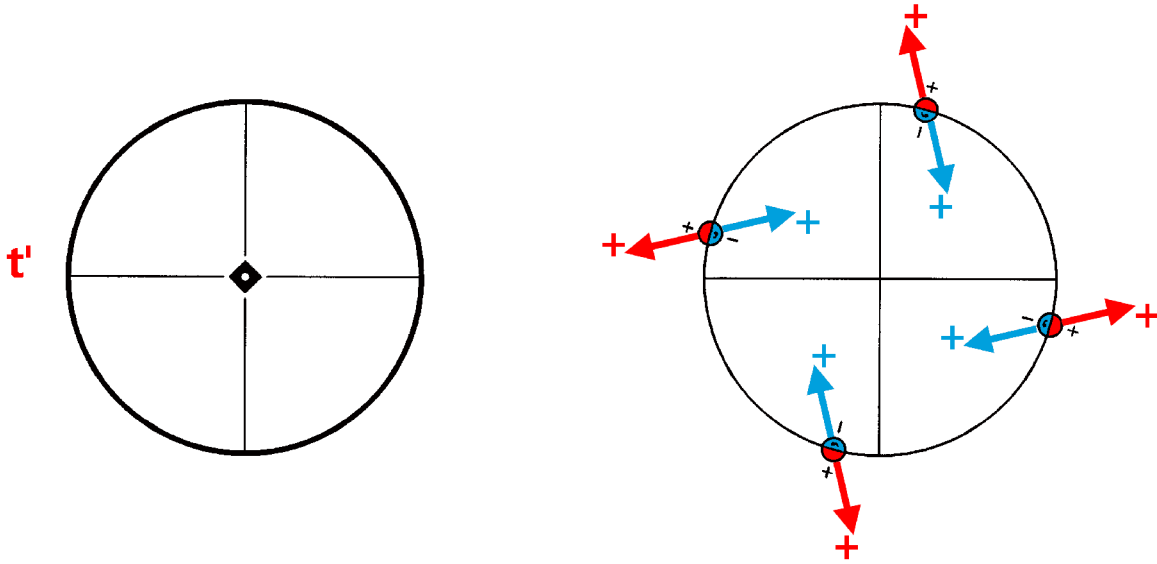
$p_{2c}4/m$

$4/m1'$

Tetragonal

No. 28.7.146

$p_{2c}4/m$



Origin at center ($4/m$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|----------------------------------|---|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^+ $0,0,z$
(4_z 0,0,0) | (4) 4^- $0,0,z$
(4_z^{-1} 0,0,0) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m $x,y,0$
(m_z 0,0,0) | (7) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0) | (8) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0) |

For $(0,0,1)'$ + set

- | | | | |
|--|--|---|--|
| (1) t' $(0,0,1)$
(1 0,0,1)' | (2) $2'$ $(0,0,1)$ $0,0,z$
(2_z 0,0,1)' | (3) $4^{+'}$ $(0,0,1)$ $0,0,z$
(4_z 0,0,1)' | (4) $4^{-'}$ $(0,0,1)$ $0,0,z$
(4_z^{-1} 0,0,1)' |
| (5) $\bar{1}'$ $0,0,1/2$
($\bar{1}$ 0,0,1)' | (6) m' $x,y,1/2$
(m_z 0,0,1)' | (7) $\bar{4}^{+'}$ $0,0,z; 0,0,1/2$
($\bar{4}_z$ 0,0,1)' | (8) $\bar{4}^{-'}$ $0,0,z; 0,0,1/2$
($\bar{4}_z^{-1}$ 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

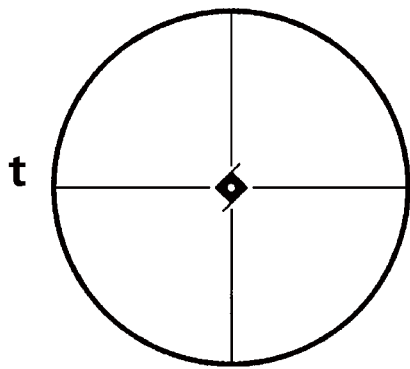
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [u,v,\bar{w}]
	(7) y,\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(8) \bar{y},x,\bar{z} [\bar{v},\bar{u},\bar{w}]
4 e m'..	$x,y,1/2$ [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]
	$\bar{y},x,1/2$ [$\bar{v},u,0$]	$y,\bar{x},1/2$ [$v,\bar{u},0$]
4 d m..	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]
	$\bar{y},x,0$ [0,0,w]	$y,\bar{x},0$ [0,0,w]
2 c 4..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]
1 b $4/m'$..	$0,0,1/2$ [0,0,0]	
1 a $4/m$..	$0,0,0$ [0,0,w]	

Symmetry of special projections

Along [001] $41'$	Along [100] $p_{2a^*} 2'mm'$ $a^* = c$	Along [110] $p_{2a^*} 2'mm'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

$p4_2/m$

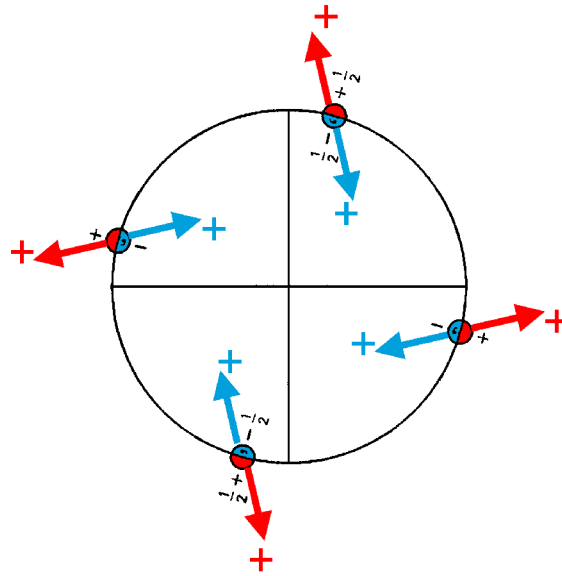
No. 29.1.147



$4/m$

$p4_2/m$

Tetragonal



Origin at center ($2/m$) on 4_2

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|------------------------------------|---|--|
| (1) 1
(1 0,0,0) | (2) $2_{0,0,z}$
(2_z 0,0,0) | (3) $4^+(0,0,1/2)$ 0,0,z
(4_z 0,0,1/2) | (4) $4^-(0,0,1/2)$ 0,0,z
(4_z^{-1} 0,0,1/2) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) $m_{x,y,0}$
(m_z 0,0,0) | (7) $\bar{4}^+$ 0,0,z; 0,0,1/4
($\bar{4}_z$ 0,0,1/2) | (8) $\bar{4}^-$ 0,0,z; 0,0,1/4
($\bar{4}_z^{-1}$ 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [\bar{v},u,w]	(4) $y,\bar{x},z+1/2$ [v,\bar{u},w]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y,\bar{z} [\bar{u},\bar{v},w]	
	(7) $y,\bar{x},\bar{z}+1/2$ [\bar{v},u,w]	(8) $\bar{y},x,\bar{z}+1/2$ [v,\bar{u},w]	
	4 d m..	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]
		$\bar{y},x,1/2$ [0,0,w]	$y,\bar{x},1/2$ [0,0,w]
	4 c 2..	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0,w]
		$0,0,\bar{z}$ [0,0,w]	$0,0,\bar{z}+1/2$ [0,0,w]
2 b $\bar{4}$..	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0,w]	
2 a $2/m$..	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0,w]	

Symmetry of special projections

Along [001] $41'$	Along [100] $p2'mm'$	Along [110] $p2'mm'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

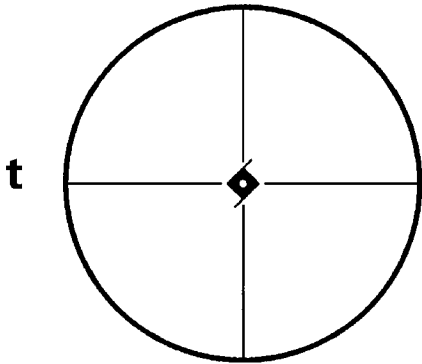
$p4_2/m1'$

$4/m1'$

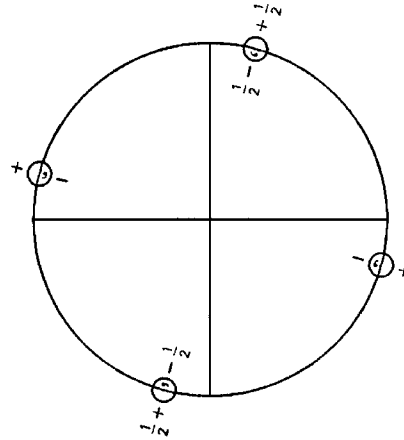
Tetragonal

No. 29.2.148

$p4_2/m1'$



1'



Origin at center ($2/m1'$) on 4_2

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

- | | | | |
|--|------------------------------------|---|--|
| (1) 1
($1 0,0,0$) | (2) 2 $0,0,z$
($2_z 0,0,0$) | (3) 4^+ ($0,0,1/2$) $0,0,z$
($4_z 0,0,1/2$) | (4) $4^-(0,0,1/2)$ $0,0,z$
($4_z^{-1} 0,0,1/2$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (6) m $x,y,0$
($m_z 0,0,0$) | (7) $\bar{4}^+$ $0,0,z; 0,0,1/4$
($\bar{4}_z 0,0,1/2$) | (8) $\bar{4}^-$ $0,0,z; 0,0,1/4$
($\bar{4}_z^{-1} 0,0,1/2$) |

For $1' +$ set

- | | | | |
|--|--------------------------------------|---|--|
| (1) $1'$
($1 0,0,0$)' | (2) $2'$ $0,0,z$
($2_z 0,0,0$)' | (3) $4^{+'}$ ($0,0,1/2$) $0,0,z$
($4_z 0,0,1/2$)' | (4) $4^{-'}$ ($0,0,1/2$) $0,0,z$
($4_z^{-1} 0,0,1/2$)' |
| (5) $\bar{1}'$ $0,0,0$
($\bar{1} 0,0,0$)' | (6) m' $x,y,0$
($m_z 0,0,0$)' | (7) $\bar{4}^{+'}$ $0,0,z; 0,0,1/4$
($\bar{4}_z 0,0,1/2$)' | (8) $\bar{4}^{-'}$ $0,0,z; 0,0,1/4$
($\bar{4}_z^{-1} 0,0,1/2$)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); $1'$

Positions

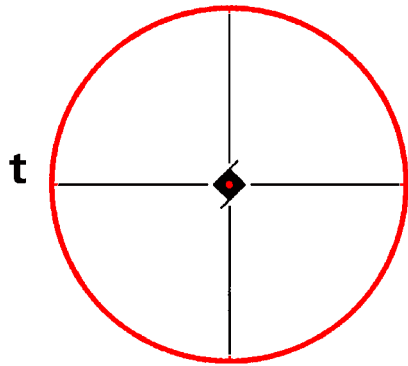
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1' +$
8 e $11'$	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]
	(3) $\bar{y},x,z+1/2$ [0,0,0]	(4) $y,\bar{x},z+1/2$ [0,0,0]
	(5) \bar{x},\bar{y},\bar{z} [0,0,0]	(6) x,y,\bar{z} [0,0,0]
	(7) $y,\bar{x},\bar{z}+1/2$ [0,0,0]	(8) $\bar{y},x,\bar{z}+1/2$ [0,0,0]
4 d $m..1'$	$x,y,0$ [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]
	$\bar{y},x,1/2$ [0,0,0]	$y,\bar{x},1/2$ [0,0,0]
4 c $2..1'$	$0,0,z$ [0,0,0]	$0,0,z+1/2$ [0,0,0]
	$0,0,\bar{z}$ [0,0,0]	$0,0,\bar{z}+1/2$ [0,0,0]
2 b $\bar{4}..1'$	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]
2 a $2/m..1'$	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]

Symmetry of special projections

Along [001] $41'$	Along [100] $p2mm1'$	Along [110] $p2mm1'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

$p4_2/m'$

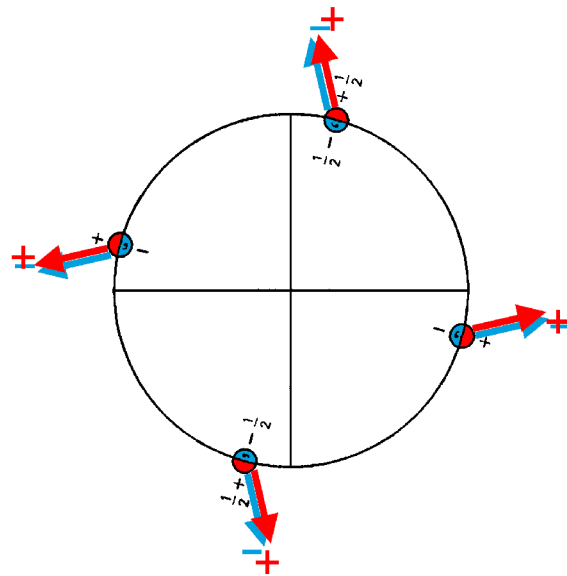
No. 29.3.149



$4/m'$

$p4_2/m'$

Tetragonal



Origin at center ($2/m'$) on 4_2

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2_{0,0,z}$
(2_z |0,0,0)

(3) $4^+(0,0,1/2)$ 0,0,z
(4_z |0,0,1/2)

(4) $4^-(0,0,1/2)$ 0,0,z
(4_z^{-1} |0,0,1/2)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m'_x x,y,0
(m'_z |0,0,0)

(7) $\bar{4}^+$ 0,0,z; 0,0,1/4
($\bar{4}_z$ |0,0,1/2)

(8) $\bar{4}^-$ 0,0,z; 0,0,1/4
($\bar{4}_z^{-1}$ |0,0,1/2)

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

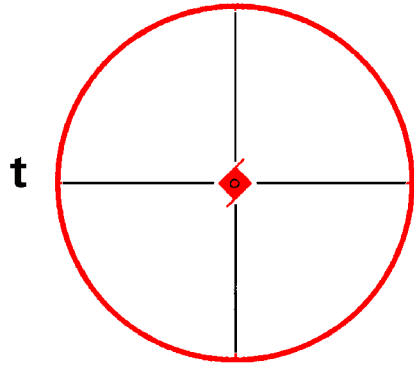
	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [\bar{v},u,w]	(4) $y,\bar{x},z+1/2$ [v,\bar{u},w]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [u,v, \bar{w}]	
	(7) $y,\bar{x},\bar{z}+1/2$ [v,\bar{u},\bar{w}]	(8) $\bar{y},x,\bar{z}+1/2$ [\bar{v},u,\bar{w}]	
	4 d m' ..	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]
		$\bar{y},x,1/2$ [$\bar{v},u,0$]	$y,\bar{x},1/2$ [$v,\bar{u},0$]
	4 c 2..	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0,w]
		$0,0,\bar{z}$ [0,0, \bar{w}]	$0,0,\bar{z}+1/2$ [0,0, \bar{w}]
2 b $\bar{4}'$..	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]	
2 a $2/m'$..	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	

Symmetry of special projections

Along [001] 4	Along [100] $p2m'm'$ $a^* = c$	Along [110] $p2m'm'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

$p4_2'/m'$

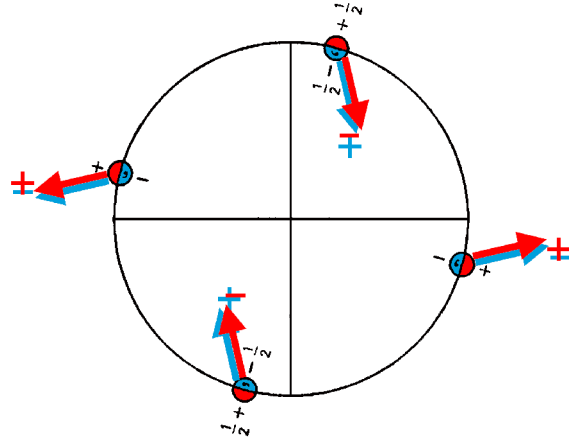
No. 29.4.150



$4'/m'$

$p4_2'/m'$

Tetragonal



Origin at center ($2/m'$) on $4_2'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2 \quad 0,0,z$
(2_z |0,0,0)

(3) $4^{+2} (0,0,1/2) \quad 0,0,z$
(4_z^{+2} |0,0,1/2)'

(4) $4^{-2} (0,0,1/2) \quad 0,0,z$
(4_z^{-2} |0,0,1/2)'

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)'

(6) m' x,y,0
(m_z |0,0,0)'

(7) $\bar{4}^+ \quad 0,0,z; 0,0,1/4$
($\bar{4}_z^+$ |0,0,1/2)

(8) $\bar{4}^- \quad 0,0,z; 0,0,1/4$
($\bar{4}_z^-$ |0,0,1/2)

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [v, \bar{u},\bar{w}]	(4) $y,\bar{x},z+1/2$ [\bar{v},u,\bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [u,v, \bar{w}]	
	(7) $y,\bar{x},\bar{z}+1/2$ [\bar{v},u,w]	(8) $\bar{y},x,\bar{z}+1/2$ [v, \bar{u},w]	
	4 d $m'..$	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]
		$\bar{y},x,1/2$ [v, $\bar{u},0$]	$y,\bar{x},1/2$ [$\bar{v},u,0$]
	4 c $2..$	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0, \bar{w}]
		$0,0,\bar{z}$ [0,0, \bar{w}]	$0,0,\bar{z}+1/2$ [0,0,w]
2 b $\bar{4}..$	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0, \bar{w}]	
2 a $2/m'..$	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	

Symmetry of special projections

Along [001] $4'$	Along [100] $p2m'm'$	Along [110] $p2m'm'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

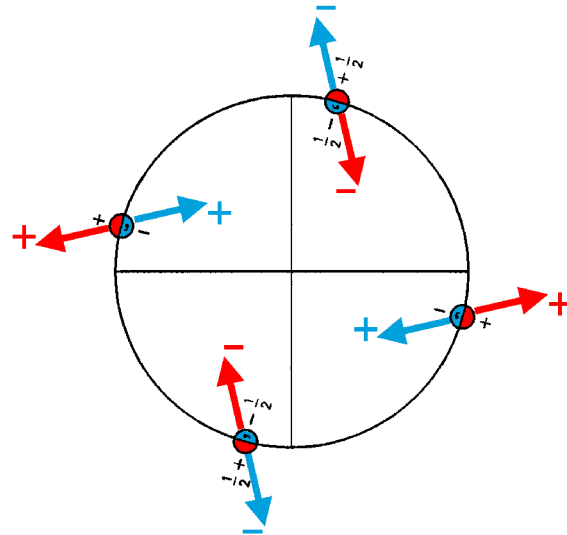
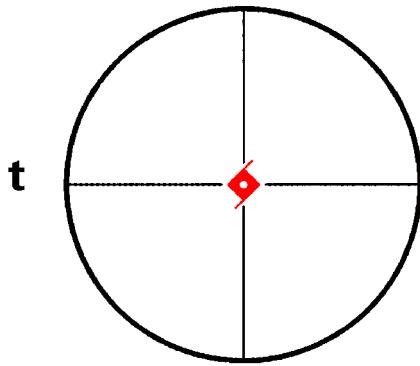
$p4_2'/m$

No. 29.5.151

$4'/m$

$p4_2'/m$

Tetragonal



Origin at center ($2/m$) on $4_2'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2_{z_2} 0,0,z
(2 _z 0,0,0) | (3) $4_2^{+'}$ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2)' | (4) $4_2^{-'}$ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m_{z_2} x,y,0
(m _z 0,0,0) | (7) $\bar{4}_2^{+'}$ 0,0,z; 0,0,1/4
($\bar{4}_z$ 0,0,1/2)' | (8) $\bar{4}_2^{-'}$ 0,0,z; 0,0,1/4
($\bar{4}_z^{-1}$ 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [v, \bar{u},\bar{w}]	(4) $y,\bar{x},z+1/2$ [\bar{v},u,\bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y,\bar{z} [\bar{u},\bar{v},w]	
	(7) $y,\bar{x},\bar{z}+1/2$ [v, \bar{u},\bar{w}]	(8) $\bar{y},x,\bar{z}+1/2$ [\bar{v},u,\bar{w}]	
	4 d m..	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]
		$\bar{y},x,1/2$ [0,0, \bar{w}]	$y,\bar{x},1/2$ [0,0, \bar{w}]
	4 c 2..	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0, \bar{w}]
		$0,0,\bar{z}$ [0,0,w]	$0,0,\bar{z}+1/2$ [0,0, \bar{w}]
2 b $\bar{4}'$..	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]	
2 a $2/m$..	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0, \bar{w}]	

Symmetry of special projections

Along [001] $41'$	Along [100] $p2'mm'$	Along [110] $p2'mm'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

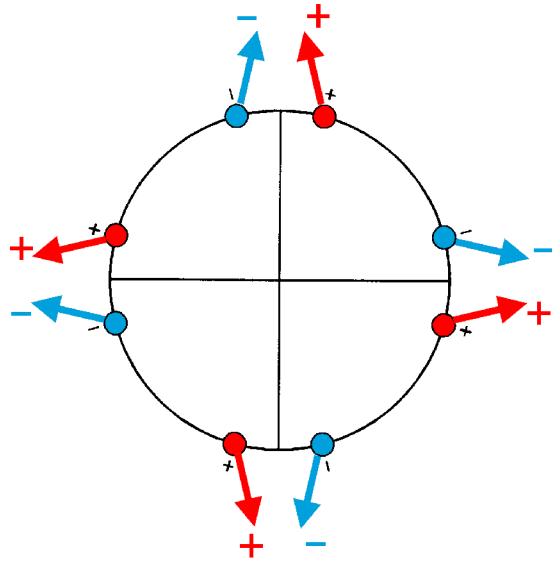
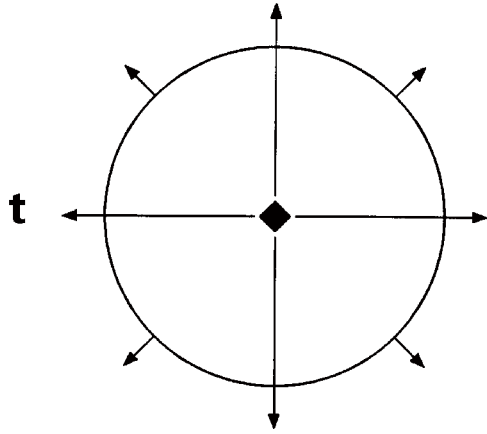
p422

422

Tetragonal

No. 30.1.152

p422



Origin at 422

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z ⁺ 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,x̄,0
(2 _{x̄y} 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]	
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	
	(7) y,x,\bar{z} [v,u,\bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	
	4 g .2.	$x,0,1/2$ [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]
		$0,x,1/2$ [0,u,0]	$0,\bar{x},1/2$ [0, $\bar{u},0$]
	4 f .2.	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]
		$0,x,0$ [0,u,0]	$0,\bar{x},0$ [0, $\bar{u},0$]
4 e ..2	$x,x,1/2$ [u,u,0]	$\bar{x},\bar{x},1/2$ [$\bar{u},\bar{u},0$]	
	$\bar{x},x,1/2$ [$\bar{u},u,0$]	$x,\bar{x},1/2$ [$u,\bar{u},0$]	
4 d ..2	$x,x,0$ [u,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	
	$\bar{x},x,0$ [$\bar{u},u,0$]	$x,\bar{x},0$ [$u,\bar{u},0$]	
2 c 4..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]	
1 b 422	$0,0,1/2$ [0,0,0]		
1 a 422	$0,0,0$ [0,0,0]		

Symmetry of special projectionsAlong [001] $4m'm'$

Origin at 0,0,z

Along [100] $p2m'm'$ $a^* = c$

Origin at x,0,0

Along [110] $p2m'm'$ $a^* = c$

Origin at x,x,0

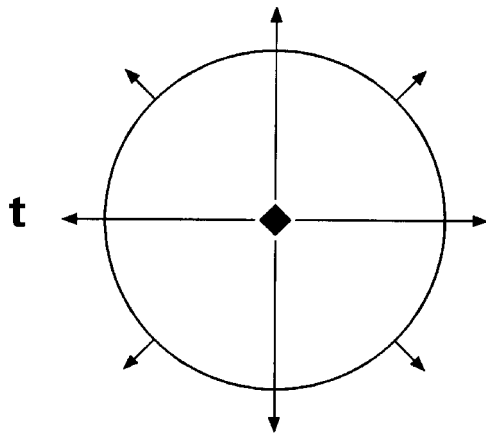
$p4221'$

$4221'$

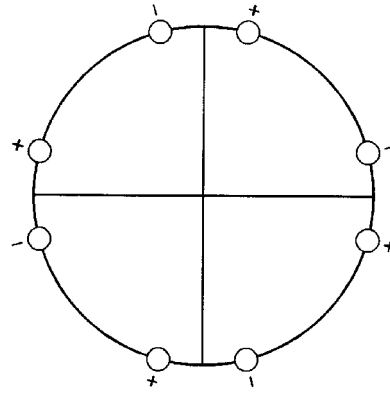
Tetragonal

No. 30.2.153

$p4221'$



$1'$



Origin at $4221'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|----------------------------------|----------------------------------|-------------------------------------|---|
| (1) 1
$(1 0,0,0)$ | (2) 2 $0,0,z$
$(2_z 0,0,0)$ | (3) 4^+ $0,0,z$
$(4_z 0,0,0)$ | (4) 4^- $0,0,z$
$(4_z^{-1} 0,0,0)$ |
| (5) 2 $0,y,0$
$(2_y 0,0,0)$ | (6) 2 $x,0,0$
$(2_x 0,0,0)$ | (7) 2 $x,x,0$
$(2_{xy} 0,0,0)$ | (8) 2 $x,\bar{x},0$
$(2_{\bar{xy}} 0,0,0)$ |

For $1'$ + set

- | | | | |
|------------------------------------|------------------------------------|--|---|
| (1) $1'$
$(1 0,0,0)'$ | (2) $2'$ $0,0,z$
$(2_z 0,0,0)'$ | (3) $4^{+'}$ $0,0,z$
$(4_z 0,0,0)'$ | (4) $4^{-'}$ $0,0,z$
$(4_z^{-1} 0,0,0)'$ |
| (5) $2'$ $0,y,0$
$(2_y 0,0,0)'$ | (6) $2'$ $x,0,0$
$(2_x 0,0,0)'$ | (7) $2'$ $x,x,0$
$(2_{xy} 0,0,0)'$ | (8) $2'$ $x,\bar{x},0$
$(2_{\bar{xy}} 0,0,0)'$ |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); $1'$

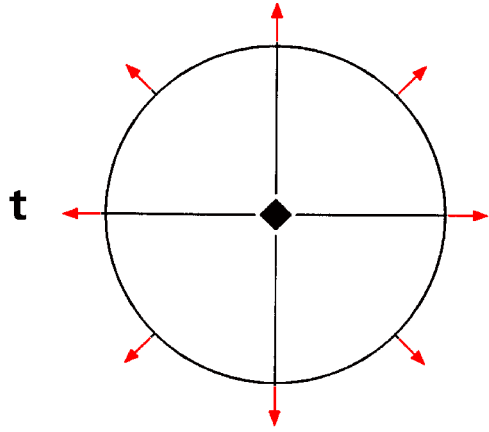
Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1'+$
8 h $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $\bar{y},x,z [0,0,0]$	(4) $y,\bar{x},z [0,0,0]$
	(5) $\bar{x},y,\bar{z} [0,0,0]$	(6) $x,\bar{y},\bar{z} [0,0,0]$
	(7) $y,x,\bar{z} [0,0,0]$	(8) $\bar{y},\bar{x},\bar{z} [0,0,0]$
4 g $.2.1'$	$x,0,1/2 [0,0,0]$	$\bar{x},0,1/2 [0,0,0]$
	$0,x,1/2 [0,0,0]$	$0,\bar{x},1/2 [0,0,0]$
4 f $.2.1'$	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$
	$0,x,0 [0,0,0]$	$0,\bar{x},0 [0,0,0]$
4 e $..21'$	$x,x,1/2 [0,0,0]$	$\bar{x},\bar{x},1/2 [0,0,0]$
	$\bar{x},x,1/2 [0,0,0]$	$x,\bar{x},1/2 [0,0,0]$
4 d $..21'$	$x,x,0 [0,0,0]$	$\bar{x},\bar{x},0 [0,0,0]$
	$\bar{x},x,0 [0,0,0]$	$x,\bar{x},0 [0,0,0]$
2 c $4..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$
1 b $4221'$	$0,0,1/2 [0,0,0]$	
1 a $4221'$	$0,0,0 [0,0,0]$	

Symmetry of special projectionsAlong $[001]$ $4mm1'$ Origin at $0,0,z$ Along $[100]$ $p2mm1'$ $a^* = c$ Origin at $x,0,0$ Along $[110]$ $p2mm1'$ $a^* = c$ Origin at $x,x,0$

$p42'2'$

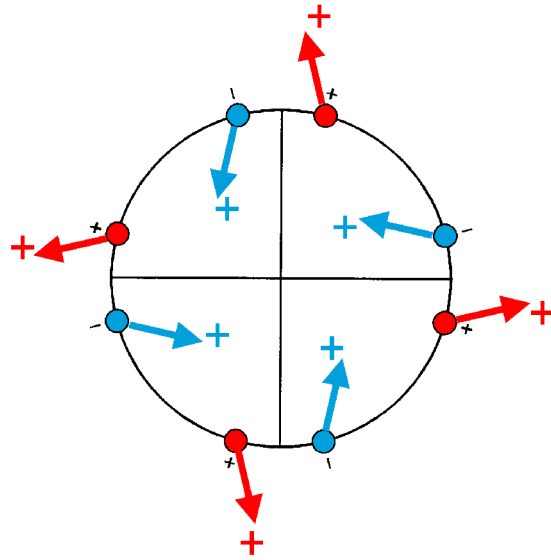
No. 30.3.154



$42'2'$

$p42'2'$

Tetragonal



Origin at $42'2'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x, \bar{x} ,0
(2 _{\bar{xy}} 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]	
	(5) \bar{x},y,\bar{z} [u,\bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]	
	4 g .2'	$x,0,1/2$ [$0,v,w$]	$\bar{x},0,1/2$ [$0,\bar{v},w$]
		$0,x,1/2$ [$\bar{v},0,w$]	$0,\bar{x},1/2$ [$v,0,w$]
	4 f .2'	$x,0,0$ [$0,v,w$]	$\bar{x},0,0$ [$0,\bar{v},w$]
		$0,x,0$ [$\bar{v},0,w$]	$0,\bar{x},0$ [$v,0,w$]
4 e ..2'	$x,x,1/2$ [u,\bar{u},w]	$\bar{x},\bar{x},1/2$ [\bar{u},u,w]	
	$\bar{x},x,1/2$ [u,u,w]	$x,\bar{x},1/2$ [\bar{u},\bar{u},w]	
4 d ..2'	$x,x,0$ [u,\bar{u},w]	$\bar{x},\bar{x},0$ [\bar{u},u,w]	
	$\bar{x},x,0$ [u,u,w]	$x,\bar{x},0$ [\bar{u},\bar{u},w]	
2 c 4..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]	
1 b 42'2'	$0,0,1/2$ [$0,0,w$]		
1 a 42'2'	$0,0,0$ [$0,0,w$]		

Continued

No. 30.3.154

$p42'2'$

Symmetry of special projections

Along $[001]$ $4mm$

Origin at $0,0,z$

Along $[100]$ $p2'mm'$

$a^* = c$

Origin at $x,0,0$

Along $[110]$ $p2'mm'$

$a^* = c$

Origin at $x,x,0$

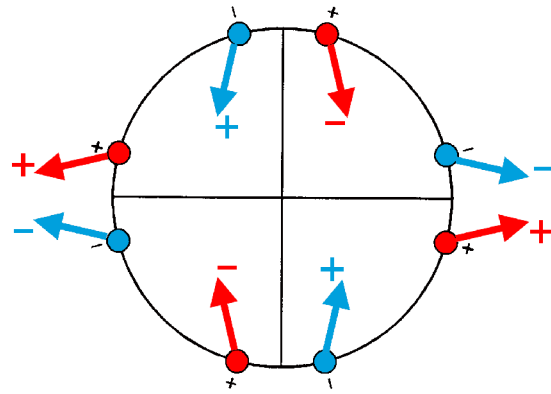
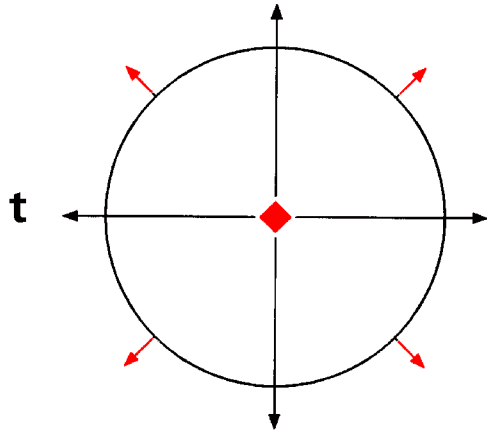
$p4'22'$

No. 30.4.155

$4'22'$

$p4'22'$

Tetragonal



Origin at $4'22'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|----------------------------------|----------------------------------|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^{+} $0,0,z$
(4_z 0,0,0)' | (4) 4^{-} $0,0,z$
(4_z^{-1} 0,0,0)' |
| (5) 2 $0,y,0$
(2_y 0,0,0) | (6) 2 $x,0,0$
(2_x 0,0,0) | (7) $2'$ $x,x,0$
(2_{xy} 0,0,0)' | (8) $2'$ $x,\bar{x},0$
($2_{\bar{xy}}$ 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]	
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]	
	4 g .2.	x,0,1/2 [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]
		0,x,1/2 [0, \bar{u} ,0]	0, $\bar{x},1/2$ [0,u,0]
	4 f .2.	x,0,0 [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]
		0,x,0 [0, \bar{u} ,0]	0, $\bar{x},0$ [0,u,0]
4 e ..2'	x,x,1/2 [u, \bar{u} ,w]	$\bar{x},\bar{x},1/2$ [\bar{u},u,w]	
	$\bar{x},x,1/2$ [\bar{u},\bar{u},\bar{w}]	$x,\bar{x},1/2$ [u,u,\bar{w}]	
4 d ..2'	x,x,0 [u, \bar{u} ,w]	$\bar{x},\bar{x},0$ [\bar{u},u,w]	
	$\bar{x},x,0$ [\bar{u},\bar{u},\bar{w}]	$x,\bar{x},0$ [u,u,\bar{w}]	
2 c 4'..	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]	
1 b 4'22'	0,0,1/2 [0,0,0]		
1 a 4'22'	0,0,0 [0,0,0]		

Symmetry of special projectionsAlong [001] $4'm'm'$

Origin at 0,0,z

Along [100] $p2m'm'$ $a^* = c$

Origin at x,0,0

Along [110] $p2'mm'$ $a^* = c$

Origin at x,x,0

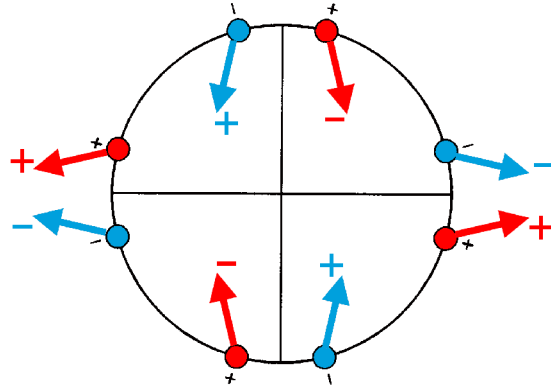
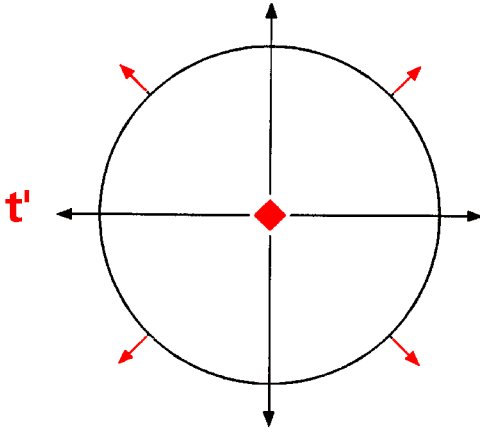
$p_{2c}4'22'$

4221'

Tetragonal

No. 30.5.156

$p_{2c}4'22'$



Origin at $4'22'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 4 ⁺ $0,0,z$
(4 _z 0,0,0)' | (4) 4 ⁻ $0,0,z$
(4 _z ⁻¹ 0,0,0)' |
|--------------------|--|--|--|

- | | | | |
|--|--|---|--|
| (5) 2 $0,y,0$
(2 _y 0,0,0) | (6) 2 $x,0,0$
(2 _x 0,0,0) | (7) 2' $x,x,0$
(2 _{xy} 0,0,0)' | (8) 2' $x,\bar{x},0$
(2 _{\bar{xy}}} 0,0,0)' |
|--|--|---|--|

For $(0,0,1)$ ' + set

- | | | | |
|--------------------------------|--|---|---|
| (1) t' $(0,0,1)$
(1 0,0,1)' | (2) 2' $(0,0,1)$ $0,0,z$
(2 _z 0,0,1)' | (3) 4 ⁺ $(0,0,1)$ $0,0,z$
(4 _z 0,0,1) | (4) 4 ⁻ $(0,0,1)$ $0,0,z$
(4 _z ⁻¹ 0,0,1) |
|--------------------------------|--|---|---|

- | | | | |
|--|--|---|--|
| (5) 2' $0,y,1/2$
(2 _y 0,0,1)' | (6) 2' $x,0,1/2$
(2 _x 0,0,1)' | (7) 2 $x,x,1/2$
(2 _{xy} 0,0,1) | (8) 2 $x,\bar{x},1/2$
(2 _{\bar{xy}}} 0,0,1) |
|--|--|---|--|

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) \bar{y},x,z [v, \bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u, \bar{v},\bar{w}]
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
4 g .2'	$x,0,1/2$ [0,v,w]	$\bar{x},0,1/2$ [0, \bar{v},w]
	$0,x,1/2$ [v,0, \bar{w}]	$0,\bar{x},1/2$ [$\bar{v},0,\bar{w}$]
4 f .2.	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]
	$0,x,0$ [0, $\bar{u},0$]	$0,\bar{x},0$ [0,u,0]
4 e ..2	$x,x,1/2$ [u,u,0]	$\bar{x},\bar{x},1/2$ [$\bar{u},\bar{u},0$]
	$\bar{x},x,1/2$ [u, $\bar{u},0$]	$x,\bar{x},1/2$ [$\bar{u},u,0$]
4 d ..2'	$x,x,0$ [u, \bar{u},w]	$\bar{x},\bar{x},0$ [\bar{u},u,w]
	$\bar{x},x,0$ [\bar{u},\bar{u},\bar{w}]	$x,\bar{x},0$ [u,u, \bar{w}]
2 c 4'..	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]
1 b 4'2'2	$0,0,1/2$ [0,0,0]	
1 a 4'22'	$0,0,0$ [0,0,0]	

Continued

No. 30.5.156

$P_{2c} 4'22'$

Symmetry of special projections

Along [001] $4mm1'$

Origin at 0,0,z

Along [100] $P_{2a^*} 2m'm'$

$a^* = c$

Origin at x,0,0

Along [110] $P_{2a^*} 2m'm'$

$a^* = c$

Origin at x,x,1/2

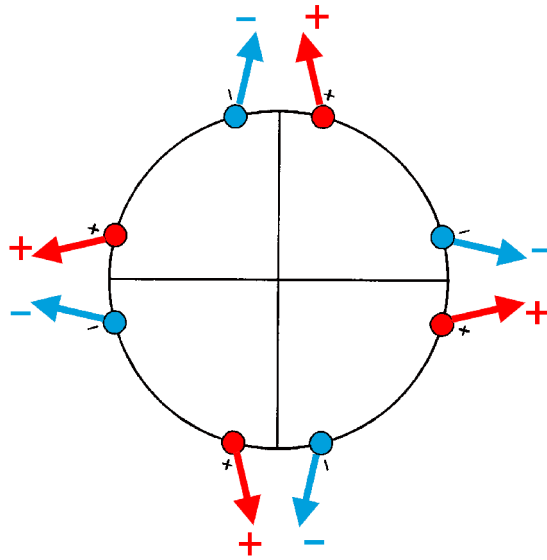
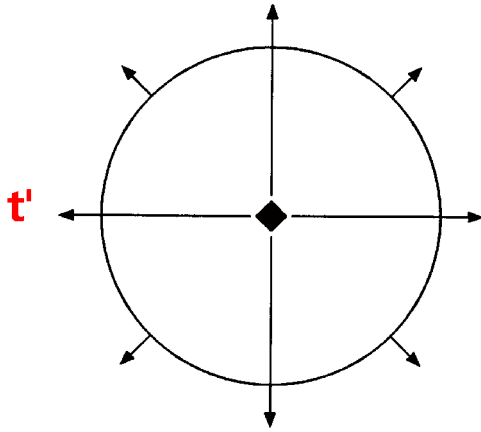
$p_{2c}422$

4221'

Tetragonal

No. 30.6.157

$p_{2c}422$



Origin at 422

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x, \bar{x} ,0
(2 _{\bar{xy}} 0,0,0) |

For (0,0,1)' + set

- | | | | |
|--|--|--|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2' (0,0,1) 0,0,z
(2 _z 0,0,1)' | (3) 4 ⁺ ' (0,0,1) 0,0,z
(4 _z 0,0,1)' | (4) 4 ⁻ ' (0,0,1) 0,0,z
(4 _z ⁻¹ 0,0,1)' |
| (5) 2' 0,y,1/2
(2 _y 0,0,1)' | (6) 2' x,0,1/2
(2 _x 0,0,1)' | (7) 2' x,x,1/2
(2 _{xy} 0,0,1)' | (8) 2' x, \bar{x} ,1/2
(2 _{\bar{xy}} 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
8 h 1	(1) x,y,z [u,v,w] (3) \bar{y},x,z [\bar{v} ,u,w] (5) \bar{x},y,\bar{z} [\bar{u} ,v, \bar{w}] (7) y,x,\bar{z} [v,u, \bar{w}]	(2) \bar{x},\bar{y},z [\bar{u} , \bar{v} ,w] (4) y,\bar{x},z [v, \bar{u} ,w] (6) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}] (8) \bar{y},\bar{x},\bar{z} [\bar{v} , \bar{u} , \bar{w}]
4 g .2'	$x,0,1/2$ [0,v,w] $0,x,1/2$ [\bar{v} ,0,w]	$\bar{x},0,1/2$ [0, \bar{v} ,w] $0,\bar{x},1/2$ [v,0,w]
4 f .2.	$x,0,0$ [u,0,0] $0,x,0$ [0,u,0]	$\bar{x},0,0$ [\bar{u} ,0,0] $0,\bar{x},0$ [0, \bar{u} ,0]
4 e ..2'	$x,x,1/2$ [u, \bar{u} ,w] $\bar{x},x,1/2$ [u,u,w]	$\bar{x},\bar{x},1/2$ [\bar{u} ,u,w] $x,\bar{x},1/2$ [\bar{u} , \bar{u} ,w]
4 d ..2	$x,x,0$ [u,u,0] $\bar{x},x,0$ [\bar{u} ,u,0]	$\bar{x},\bar{x},0$ [\bar{u} , \bar{u} ,0] $x,\bar{x},0$ [u, \bar{u} ,0]
2 c 4..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]
1 b 42'2'	$0,0,1/2$ [0,0,w]	
1 a 422	$0,0,0$ [0,0,0]	

Symmetry of special projectionsAlong [001] $4mm1'$

Origin at 0,0,z

Along [100] $p_{2a^*} 2m'm'$ $a^* = c$

Origin at x,0,0

Along [110] $p_{2a^*} 2m'm'$ $a^* = c$

Origin at x,x,0

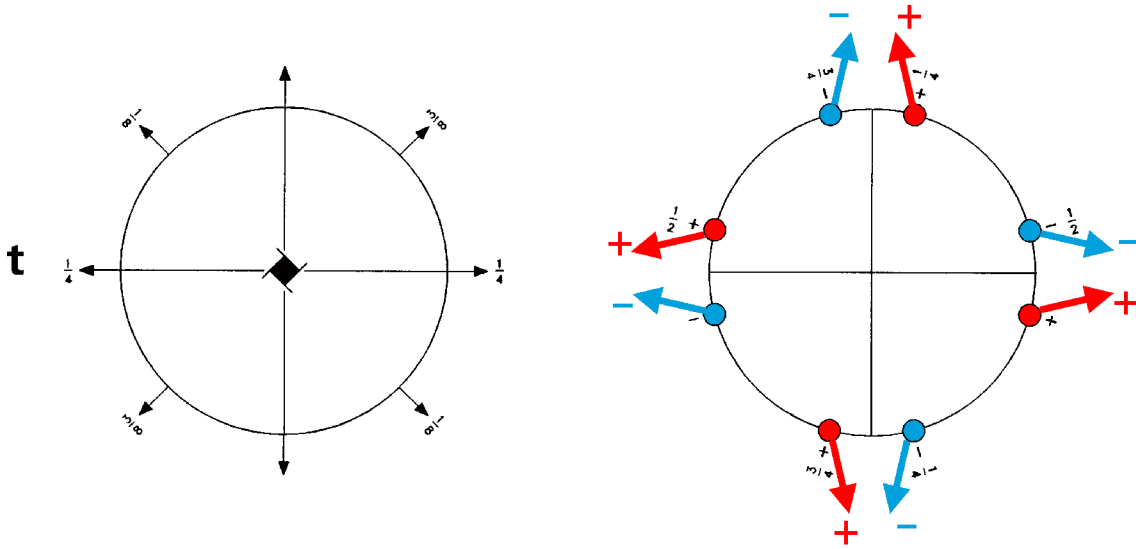
$p4_122$

422

Tetragonal

No. 31.1.158

$p4_122$



Origin on $2[100]$ at $4_1(2,1)1$

Asymmetric unit $0 \leq z \leq 1/8$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,1/4) 0,0,z
(4 _z 0,0,1/4) | (4) 4 ⁻ (0,0,3/4) 0,0,z
(4 _z ⁻¹ 0,0,3/4) |
| (5) 2 x,0,0
(2 _y 0,0,0) | (6) 2 0,y,1/4
(2 _x 0,0,1/2) | (7) 2 x,x,1/8
(2 _{xy} 0,0,1/4) | (8) 2 x, \bar{x} ,3/8
(2 _{\bar{xy}} 0,0,3/4) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 c 1	(1) x, y, z [u, v, w]	(2) $\bar{x}, \bar{y}, z + 1/2$ [\bar{u}, \bar{v}, w]	
	(3) $\bar{y}, x, z + 1/4$ [\bar{v}, u, w]	(4) $y, \bar{x}, z + 3/4$ [v, \bar{u}, w]	
	(5) x, \bar{y}, \bar{z} [u, \bar{v}, \bar{w}]	(6) $\bar{x}, y, \bar{z} + 1/2$ [\bar{u}, v, \bar{w}]	
	(7) $y, x, \bar{z} + 1/4$ [v, u, \bar{w}]	(8) $\bar{y}, \bar{x}, \bar{z} + 3/4$ [$\bar{v}, \bar{u}, \bar{w}$]	
	4 b ..2	$x, x, 1/8$ [u, u, 0]	$\bar{x}, \bar{x}, 5/8$ [$\bar{u}, \bar{u}, 0$]
		$\bar{x}, x, 3/8$ [$\bar{u}, u, 0$]	$x, \bar{x}, 7/8$ [$u, \bar{u}, 0$]
	4 a .2.	$x, 0, 0$ [u, 0, 0]	$\bar{x}, 0, 1/2$ [$\bar{u}, 0, 0$]
		$0, x, 1/4$ [0, u, 0]	$0, \bar{x}, 3/4$ [0, $\bar{u}, 0$]

Symmetry of special projections

Along [001] 4m'm'	Along [100] p2m'g' a* = c	Along [110] p2m'g' a* = c
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,1/8

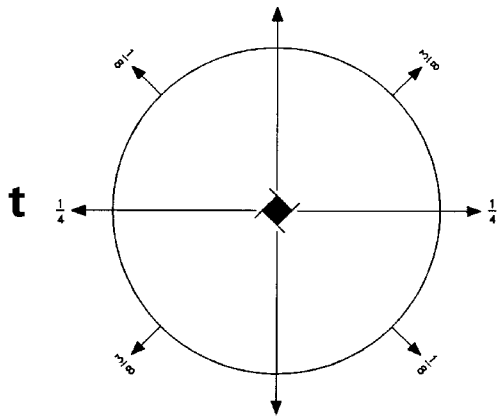
$p4_1221'$

4221'

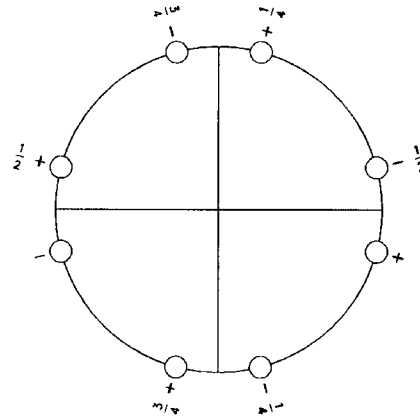
Tetragonal

No. 31.2.159

$p4_1221'$



1'



Origin on $21'[100]$ at $4_1(2,1)11'$

Asymmetric unit $0 \leq z \leq 1/8$

Symmetry operations

For 1 + set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,1/4) 0,0,z
(4 _z 0,0,1/4) | (4) 4 ⁻ (0,0,3/4) 0,0,z
(4 _z ⁻¹ 0,0,3/4) |
| (5) 2 x,0,0
(2 _y 0,0,0) | (6) 2 0,y,1/4
(2 _x 0,0,1/2) | (7) 2 x,x,1/8
(2 _{xy} 0,0,1/4) | (8) 2 x,x̄,3/8
(2 _{xy} 0,0,3/4) |

For 1' + set

- | | | | |
|--|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' (0,0,1/2) 0,0,z
(2 _z 0,0,1/2)' | (3) 4 ⁺ ' (0,0,1/4) 0,0,z
(4 _z 0,0,1/4)' | (4) 4 ⁻ ' (0,0,3/4) 0,0,z
(4 _z ⁻¹ 0,0,3/4)' |
| (5) 2' x,0,0
(2 _y 0,0,0)' | (6) 2' 0,y,1/4
(2 _x 0,0,1/2)' | (7) 2' x,x,1/8
(2 _{xy} 0,0,1/4)' | (8) 2' x,x̄,3/8
(2 _{xy} 0,0,3/4)' |

Generators selected (1); t(0,0,1); (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
8 c 11'	(1) x,y,z [0,0,0]	(2) $\bar{x},\bar{y},z+1/2$ [0,0,0]
	(3) $\bar{y},x,z+1/4$ [0,0,0]	(4) $y,\bar{x},z+3/4$ [0,0,0]
	(5) x,\bar{y},\bar{z} [0,0,0]	(6) $\bar{x},y,\bar{z}+1/2$ [0,0,0]
	(7) $y,x,\bar{z}+1/4$ [0,0,0]	(8) $\bar{y},\bar{x},\bar{z}+3/4$ [0,0,0]
4 b ..21'	$x,x,1/8$ [0,0,0]	$\bar{x},\bar{x},5/8$ [0,0,0]
	$\bar{x},x,3/8$ [0,0,0]	$x,\bar{x},7/8$ [0,0,0]
4 a .2.1'	$x,0,0$ [0,0,0]	$\bar{x},0,1/2$ [0,0,0]
	$0,x,1/4$ [0,0,0]	$0,\bar{x},3/4$ [0,0,0]

Symmetry of special projections

Along [001] 4mm1'	Along [100] p2mg1'	Along [110] p2mg1'
Origin at 0,0,z	a* = c Origin at x,0,0	a* = c Origin at x,x,1/8

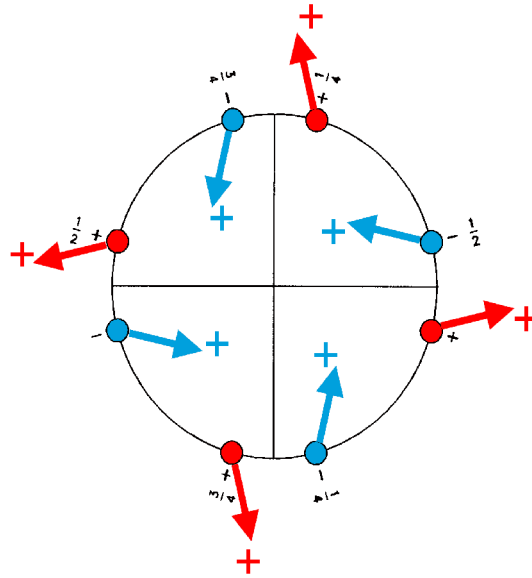
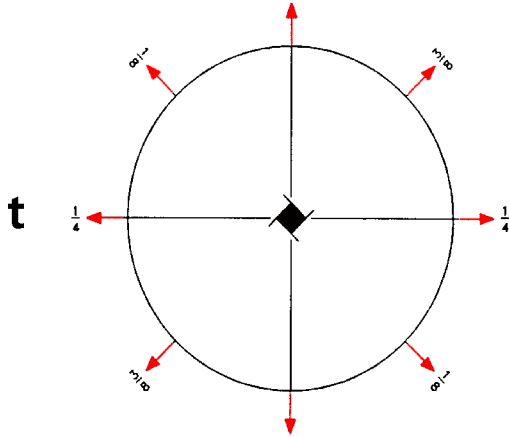
$p4_12'2'$

$42'2'$

Tetragonal

No. 31.3.160

$p4_12'2'$



Origin on $2'[100]$ at $4_1(2',1)1$

Asymmetric unit $0 \leq z \leq 1/8$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,1/4) 0,0,z
(4 _z 0,0,1/4) | (4) 4 ⁻ (0,0,3/4) 0,0,z
(4 _z ⁻¹ 0,0,3/4) |
| (5) 2' x,0,0
(2 _y 0,0,0)' | (6) 2' 0,y,1/4
(2 _x 0,0,1/2)' | (7) 2' x,x,1/8
(2 _{xy} 0,0,1/4)' | (8) 2' x, \bar{x} ,3/8
(2 _{\bar{xy}} 0,0,3/4)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 c 1	(1) x, y, z [u,v,w]	(2) $\bar{x}, \bar{y}, z+1/2$ [\bar{u}, \bar{v}, w]	
	(3) $\bar{y}, x, z+1/4$ [\bar{v}, u, w]	(4) $y, \bar{x}, z+3/4$ [v, \bar{u}, w]	
	(5) x, \bar{y}, \bar{z} [\bar{u}, v, w]	(6) $\bar{x}, y, \bar{z}+1/2$ [u, \bar{v}, w]	
	(7) $y, x, \bar{z}+1/4$ [\bar{v}, \bar{u}, w]	(8) $\bar{y}, \bar{x}, \bar{z}+3/4$ [v, u, w]	
	4 b ..2'	$x, x, 1/8$ [u, \bar{u} ,w]	$\bar{x}, \bar{x}, 5/8$ [\bar{u}, u, w]
		$\bar{x}, x, 3/8$ [u,u,w]	$x, \bar{x}, 7/8$ [\bar{u}, \bar{u}, w]
	4 a .2.'	$x, 0, 0$ [0,v,w]	$\bar{x}, 0, 1/2$ [0, \bar{v}, w]
		$0, x, 1/4$ [$\bar{v}, 0, w$]	$0, \bar{x}, 3/4$ [$v, 0, w$]

Symmetry of special projections

Along [001] 4mm	Along [100] $p2'mg'$ $a^* = c$	Along [110] $p2'mg'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,1/8

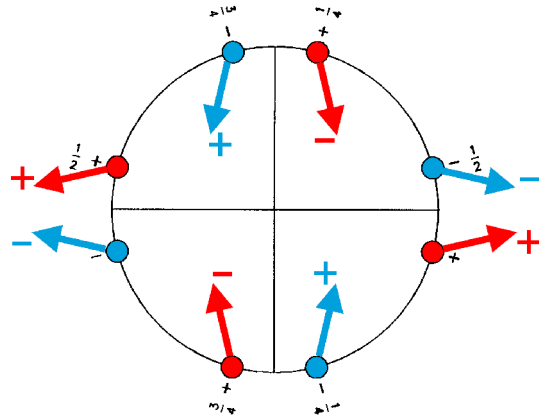
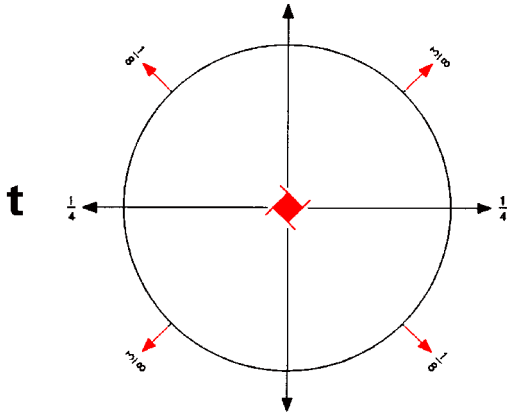
$p4_1'22'$

$4'22'$

Tetragonal

No. 31.4.161

$p4_1'22'$



Origin on $2[100]$ at $4_1'(2,1)1$

Asymmetric unit $0 \leq z \leq 1/8$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,1/4) 0,0,z
(4 _z 0,0,1/4)' | (4) 4 ⁻ (0,0,3/4) 0,0,z
(4 _z ⁻¹ 0,0,3/4)' |
| (5) 2 x,0,0
(2 _y 0,0,0) | (6) 2 0,y,1/4
(2 _x 0,0,1/2) | (7) 2' x,x,1/8
(2 _{xy} 0,0,1/4)' | (8) 2' x, \bar{x} ,3/8
(2 _{\bar{xy}} 0,0,3/4)' |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 c 1	(1) x, y, z [u,v,w]	(2) $\bar{x}, \bar{y}, z+1/2$ [\bar{u}, \bar{v}, w]	
	(3) $\bar{y}, x, z+1/4$ [v, \bar{u}, \bar{w}]	(4) $y, \bar{x}, z+3/4$ [\bar{v}, u, \bar{w}]	
	(5) x, \bar{y}, \bar{z} [u, \bar{v}, \bar{w}]	(6) $\bar{x}, y, \bar{z}+1/2$ [\bar{u}, v, \bar{w}]	
	(7) $y, x, \bar{z}+1/4$ [\bar{v}, \bar{u}, w]	(8) $\bar{y}, \bar{x}, \bar{z}+3/4$ [v, u, w]	
	4 b ..2'	$x, x, 1/8$ [u, \bar{u} ,w]	$\bar{x}, \bar{x}, 5/8$ [\bar{u}, u, w]
		$\bar{x}, x, 3/8$ [$\bar{u}, \bar{u}, \bar{w}$]	$x, \bar{x}, 7/8$ [u,u, \bar{w}]
	4 a .2.	$x, 0, 0$ [u,0,0]	$\bar{x}, 0, 1/2$ [$\bar{u}, 0, 0$]
		$0, x, 1/4$ [0, \bar{u} ,0]	$0, \bar{x}, 3/4$ [0,u,0]

Symmetry of special projections

Along [001] 4'm'm	Along [100] p2m'g'	Along [110] p2'mg'
Origin at 0,0,z	a* = c Origin at x,0,0	a* = c Origin at x,x,1/8

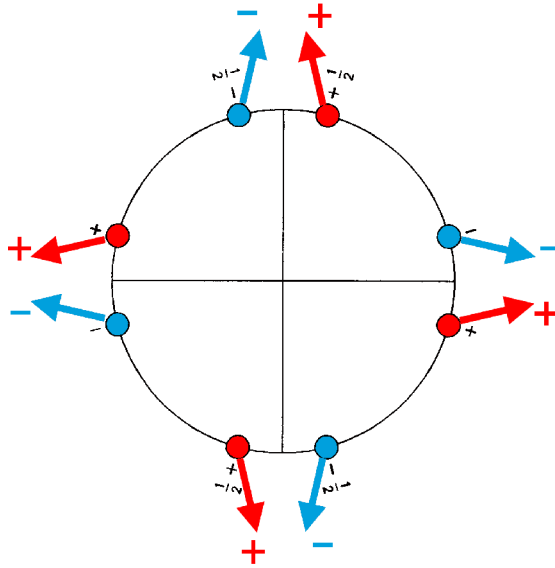
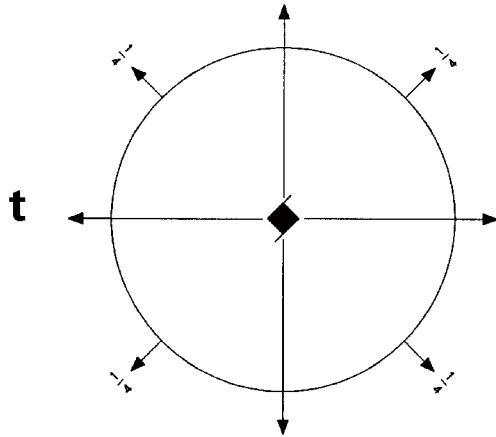
$p4_222$

422

Tetragonal

No. 32.1.162

$p4_222$



Origin at 222 at 4_221

Asymmetric unit $0 \leq x; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2) | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,1/4
(2 _{xy} 0,0,1/2) | (8) 2 x, \bar{x} ,1/4
(2 _{\bar{xy}} 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [\bar{v},u,w]	(4) $y,\bar{x},z+1/2$ [v,\bar{u},w]	
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	
	(7) $y,x,\bar{z}+1/2$ [v,u,\bar{w}]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	
	4 g ..2	x,x,3/4 [u,u,0]	$\bar{x},\bar{x},3/4$ [$\bar{u},\bar{u},0$]
		$\bar{x},x,1/4$ [$\bar{u},u,0$]	$x,\bar{x},1/4$ [$u,\bar{u},0$]
	4 f ..2	x,x,1/4 [u,u,0]	$\bar{x},\bar{x},1/4$ [$\bar{u},\bar{u},0$]
		$\bar{x},x,3/4$ [$\bar{u},u,0$]	$x,\bar{x},3/4$ [$u,\bar{u},0$]
4 e .2.	x,0,1/2 [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]	
	0,x,0 [0,u,0]	0, $\bar{x},0$ [0, $\bar{u},0$]	
4 d .2.	x,0,0 [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]	
	0,x,1/2 [0,u,0]	0, $\bar{x},1/2$ [0, $\bar{u},0$]	
4 c 2..	0,0,z [0,0,w]	0,0,z+1/2 [0,0,w]	
	0,0, \bar{z} [0,0, \bar{w}]	0,0, $\bar{z}+1/2$ [0,0, \bar{w}]	
2 b 2.22	0,0,1/4 [0,0,0]	0,0,3/4 [0,0,0]	
2 a 222.	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]	

Symmetry of special projectionsAlong [001] $4m'm'$

Origin at 0,0,z

Along [100] $p2m'm'$ $a^* = c$

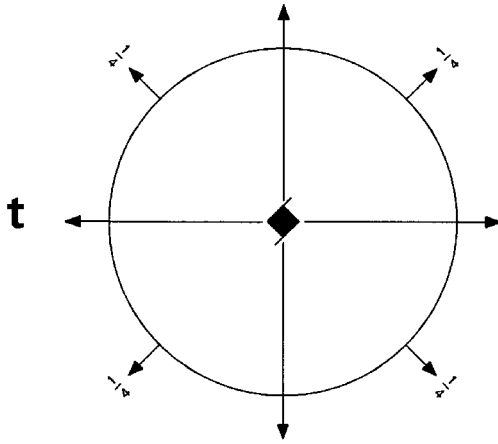
Origin at x,0,0

Along [110] $p2m'm'$ $a^* = c$

Origin at x,x,1/4

$p4_2221'$

No. 32.2.163

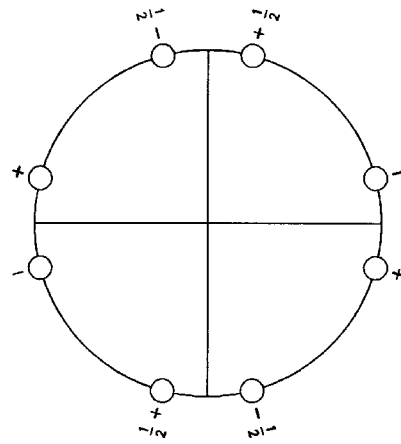


$4221'$

$p4_2221'$

Tetragonal

1'



Origin at $2221'$ at $4_2211'$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1/4$

Symmetry operations

For $1 +$ set

(1) 1 (1 0,0,0)	(2) 2 0,0,z (2 _z 0,0,0)	(3) 4 ⁺ (0,0,1/2) 0,0,z (4 _z 0,0,1/2)	(4) 4 ⁻ (0,0,1/2) 0,0,z (4 _z ⁻¹ 0,0,1/2)
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(5) 2 0,y,0 (2 _y 0,0,0)	(6) 2 x,0,0 (2 _x 0,0,0)	(7) 2 x,x,1/4 (2 _{xy} 0,0,1/2)	(8) 2 x, \bar{x} ,1/4 (2 _{\bar{xy}} 0,0,1/2)
--	--	---	--

For $1' +$ set

(1) 1' (1 0,0,0)'	(2) 2' 0,0,z (2 _z 0,0,0)'	(3) 4 ⁺ ' (0,0,1/2) 0,0,z (4 _z 0,0,1/2)'	(4) 4 ⁻ ' (0,0,1/2) 0,0,z (4 _z ⁻¹ 0,0,1/2)'
----------------------	--	--	--

(5) 2' 0,y,0 (2 _y 0,0,0)'	(6) 2' x,0,0 (2 _x 0,0,0)'	(7) 2' x,x,1/4 (2 _{xy} 0,0,1/2)'	(8) 2' x, \bar{x} ,1/4 (2 _{\bar{xy}} 0,0,1/2)'
--	--	---	--

Generators selected (1); t(0,0,1); (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
8 h 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]
	(3) $\bar{y},x,z+1/2$ [0,0,0]	(4) $y,\bar{x},z+1/2$ [0,0,0]
	(5) \bar{x},y,\bar{z} [0,0,0]	(6) x,\bar{y},\bar{z} [0,0,0]
	(7) $y,x,\bar{z}+1/2$ [0,0,0]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [0,0,0]
4 g ..21'	x,x,3/4 [0,0,0]	$\bar{x},\bar{x},3/4$ [0,0,0]
	$\bar{x},x,1/4$ [0,0,0]	$x,\bar{x},1/4$ [0,0,0]
4 f ..21'	x,x,1/4 [0,0,0]	$\bar{x},\bar{x},1/4$ [0,0,0]
	$\bar{x},x,3/4$ [0,0,0]	$x,\bar{x},3/4$ [0,0,0]
4 e .2.1'	x,0,1/2 [0,0,0]	$\bar{x},0,1/2$ [0,0,0]
	0,x,0 [0,0,0]	0, \bar{x} ,0 [0,0,0]
4 d .2.1'	x,0,0 [0,0,0]	$\bar{x},0,0$ [0,0,0]
	0,x,1/2 [0,0,0]	0, \bar{x} ,1/2 [0,0,0]
4 c 2..1'	0,0,z [0,0,0]	0,0,z+1/2 [0,0,0]
	0,0, \bar{z} [0,0,0]	0,0, $\bar{z}+1/2$ [0,0,0]
2 b 2.221'	0,0,1/4 [0,0,0]	0,0,3/4 [0,0,0]
2 a 222.1'	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]

Symmetry of special projectionsAlong [001] $4mm1'$

Origin at 0,0,z

Along [100] $p2mm1'$ $a^* = c$

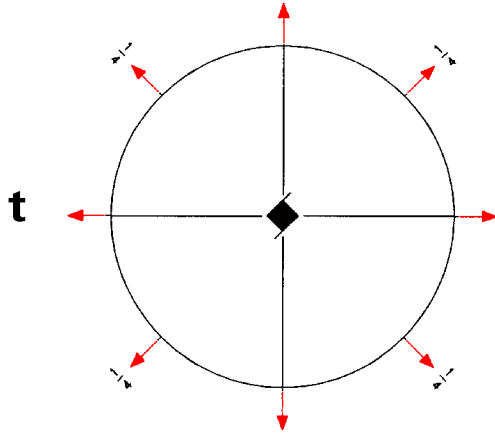
Origin at x,0,0

Along [110] $p2mm1'$ $a^* = c$

Origin at x,x,1/4

$p4_22'2'$

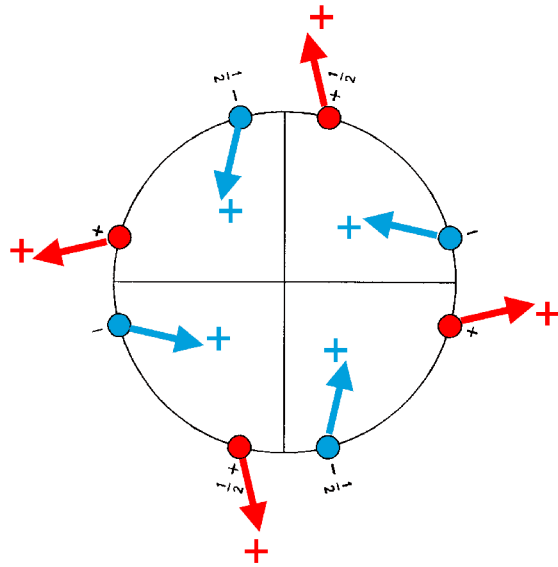
No. 32.3.164



$42'2'$

$p4_22'2'$

Tetragonal



Origin at $2'2'2'$ at $4_22'1$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--------------------------------------|--------------------------------------|--|--|
| (1) 1
(1 0,0,0) | (2) $2_{0,0,z}$
(2_z 0,0,0) | (3) 4^+ (0,0,1/2) 0,0,z
(4_z 0,0,1/2) | (4) 4^- (0,0,1/2) 0,0,z
(4_z^{-1} 0,0,1/2) |
| (5) $2'_y$ 0,y,0
(2_y 0,0,0)' | (6) $2'_x$ x,0,0
(2_x 0,0,0)' | (7) $2'_{xy}$ x,x,1/4
(2_{xy} 0,0,1/2)' | (8) $2'_{\bar{xy}}$ x, \bar{x} ,1/4
($2_{\bar{xy}}$ 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [\bar{v},u,w]	(4) $y,\bar{x},z+1/2$ [v,\bar{u},w]	
	(5) \bar{x},y,\bar{z} [u,\bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	
	(7) $y,x,\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	
	4 g ..2'	$x,x,3/4$ [u, \bar{u},w]	$\bar{x},\bar{x},3/4$ [\bar{u},u,w]
		$\bar{x},x,1/4$ [u,u,w]	$x,\bar{x},1/4$ [\bar{u},\bar{u},w]
	4 f ..2'	$x,x,1/4$ [u, \bar{u},w]	$\bar{x},\bar{x},1/4$ [\bar{u},u,w]
		$\bar{x},x,3/4$ [u,u,w]	$x,\bar{x},3/4$ [\bar{u},\bar{u},w]
4 e .2'	$x,0,1/2$ [0,v,w]	$\bar{x},0,1/2$ [0, \bar{v},w]	
	$0,x,0$ [$\bar{v},0,w$]	$0,\bar{x},0$ [$v,0,w$]	
4 d .2'	$x,0,0$ [0,v,w]	$\bar{x},0,0$ [0, \bar{v},w]	
	$0,x,1/2$ [$\bar{v},0,w$]	$0,\bar{x},1/2$ [$v,0,w$]	
4 c 2..	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0,w]	
	$0,0,\bar{z}$ [0,0,w]	$0,0,\bar{z}+1/2$ [0,0,w]	
2 b 2.2'2'	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0,w]	
2 a 2.2'2'	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0,w]	

Continued

No. 32.3.164

$p4_2 2'2'$

Symmetry of special projections

Along [001] 4mm

Along [100] $p2'mm'$

Along [110] $p2'mm'$

$a^* = c$

$a^* = c$

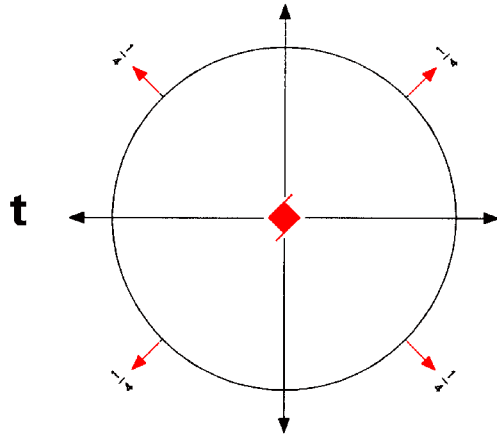
Origin at 0,0,z

Origin at x,0,0

Origin at x,x,1/4

$p4_2'22'$

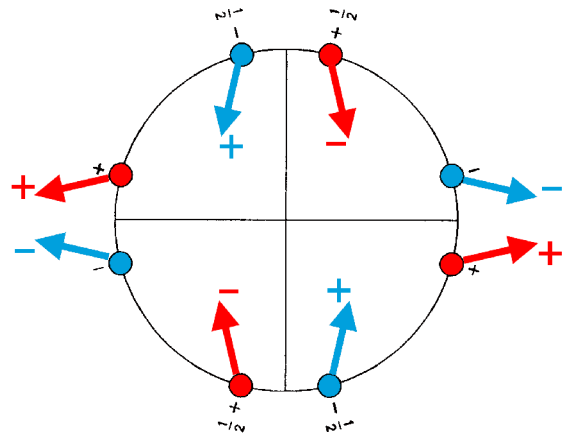
No. 32.4.165



$4'22'$

Tetragonal

$p4_2'22'$



Origin at 222 at $4_2'21$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|----------------------------------|----------------------------------|---|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^{+} (0,0,1/2) $0,0,z$
(4_z 0,0,1/2)' | (4) 4^{-} (0,0,1/2) $0,0,z$
(4_z^{-1} 0,0,1/2)' |
| (5) 2 $0,y,0$
(2_y 0,0,0) | (6) 2 $x,0,0$
(2_x 0,0,0) | (7) $2'$ $x,x,1/4$
(2_{xy} 0,0,1/2)' | (8) $2'$ $x,\bar{x},1/4$
($2_{\bar{xy}}$ 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [v, \bar{u},\bar{w}]	(4) $y,\bar{x},z+1/2$ [\bar{v},u,\bar{w}]	
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u, \bar{v},\bar{w}]	
	(7) $y,x,\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	
	4 g ..2'	$x,x,3/4$ [u, \bar{u},w]	$\bar{x},\bar{x},3/4$ [\bar{u},u,w]
		$\bar{x},x,1/4$ [\bar{u},\bar{u},\bar{w}]	$x,\bar{x},1/4$ [u,u, \bar{w}]
	4 f ..2'	$x,x,1/4$ [u, \bar{u},w]	$\bar{x},\bar{x},1/4$ [\bar{u},u,w]
		$\bar{x},x,3/4$ [\bar{u},\bar{u},\bar{w}]	$x,\bar{x},3/4$ [u,u, \bar{w}]
4 e .2.	$x,0,1/2$ [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]	
	$0,x,0$ [0, $\bar{u},0$]	$0,\bar{x},0$ [0,u,0]	
4 d .2.	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]	
	$0,x,1/2$ [0, $\bar{u},0$]	$0,\bar{x},1/2$ [0,u,0]	
4 c 2..	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0, \bar{w}]	
	$0,0,\bar{z}$ [0,0, \bar{w}]	$0,0,\bar{z}+1/2$ [0,0,w]	
2 b 2.2'2'	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0, \bar{w}]	
2 a 222.	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	

Continued

No. 32.4.165

$p4_2'22'$

Symmetry of special projections

Along [001] $4'm'm$

Origin at 0,0,z

Along [100] $p2'mm'$

$a^* = c$

Origin at x,0,0

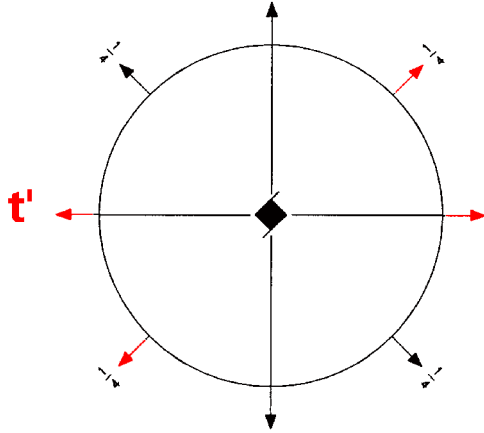
Along [110] $p2'mm'$

$a^* = c$

Origin at x,x,1/4

$p_{2c}4_222$

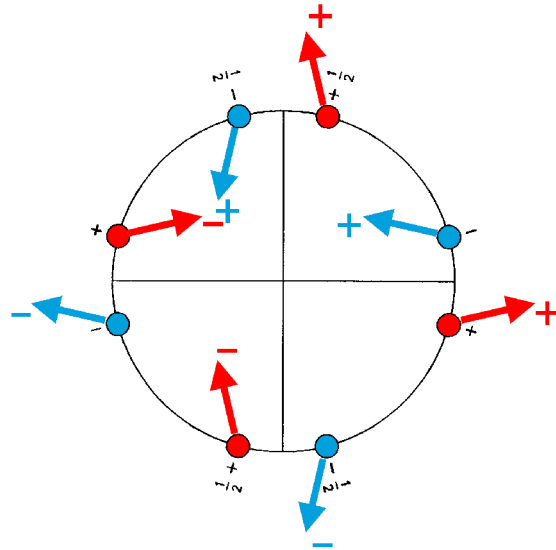
No. 32.5.166



4221'

Tetragonal

$p_{2c}4_222$



Origin at $22'2'$ at 4_221

Asymmetric unit $0 \leq x$; $0 \leq z \leq 1/4$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|------------------------------------|------------------------------------|--|---|
| (1) 1
(1 0,0,0) | (2) $2'$ 0,0,z
(2_z 0,0,0)' | (3) 4^+ (0,0,1/2) 0,0,z
(4_z 0,0,1/2) | (4) 4^- (0,0,1/2) 0,0,z
(4_z^{-1} 0,0,1/2)' |
| (5) $2'$ 0,y,0
(2_y 0,0,0)' | (6) 2 x,0,0
(2_x 0,0,0) | (7) 2 x,x,1/4
(2_{xy} 0,0,1/2) | (8) $2'$ x, \bar{x} ,1/4
($2_{\bar{xy}}$ 0,0,1/2)' |

For $(0,0,1)'$ + set

- | | | | |
|------------------------------------|--|--|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2 (0,0,1) 0,0,z
(2_z 0,0,1) | (3) $4^{+'}$ (0,0,3/2) 0,0,z
(4_z 0,0,3/2)' | (4) $4^{-'}$ (0,0,3/2) 0,0,z
(4_z^{-1} 0,0,3/2)' |
| (5) 2 0,y,1/2
(2_y 0,0,1) | (6) $2'$ x,0,1/2
(2_x 0,0,1)' | (7) $2'$ x,x,3/4
(2_{xy} 0,0,3/2)' | (8) 2 x, \bar{x} ,3/4
($2_{\bar{xy}}$ 0,0,3/2) |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]
	(3) $\bar{y},x,z+1/2$ [\bar{v} ,u,w]	(4) $y,\bar{x},z+1/2$ [\bar{v} ,u, \bar{w}]
	(5) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(6) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
	(7) $y,x,\bar{z}+1/2$ [v,u, \bar{w}]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]
4 g ..2'	$x,x,3/4$ [u, \bar{u} ,w]	$\bar{x},\bar{x},3/4$ [u, \bar{u} , \bar{w}]
	$\bar{x},x,1/4$ [\bar{u} , \bar{u} , \bar{w}]	$x,\bar{x},1/4$ [\bar{u} , \bar{u} ,w]
4 f ..2	$x,x,1/4$ [u,u,0]	$\bar{x},\bar{x},1/4$ [u,u,0]
	$\bar{x},x,3/4$ [\bar{u} ,u,0]	$x,\bar{x},3/4$ [\bar{u} ,u,0]
4 e .2'	$x,0,1/2$ [0,v,w]	$\bar{x},0,1/2$ [0,v, \bar{w}]
	$0,x,0$ [v,0, \bar{w}]	$0,\bar{x},0$ [v,0,w]
4 d .2.	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [u,0,0]
	$0,x,1/2$ [0,u,0]	$0,\bar{x},1/2$ [0,u,0]
4 c 2'..	$0,0,z$ [u,v,0]	$0,0,z+1/2$ [\bar{v} ,u,0]
	$0,0,\bar{z}$ [u, \bar{v} ,0]	$0,0,\bar{z}+1/2$ [v,u,0]
2 b 2'.22'	$0,0,1/4$ [u,u,0]	$0,0,3/4$ [\bar{u} ,u,0]
2 a 2'22'.	$0,0,0$ [u,0,0]	$0,0,1/2$ [0,u,0]

Symmetry of special projectionsAlong [001] $4mm1'$

Origin at 0,0,z

Along [100] $p_{2a^*} 2m'm'$ $a^* = c$

Origin at x,0,0

Along [110] $p_{2a^*} 2m'm'$ $a^* = c$

Origin at x,x,1/4

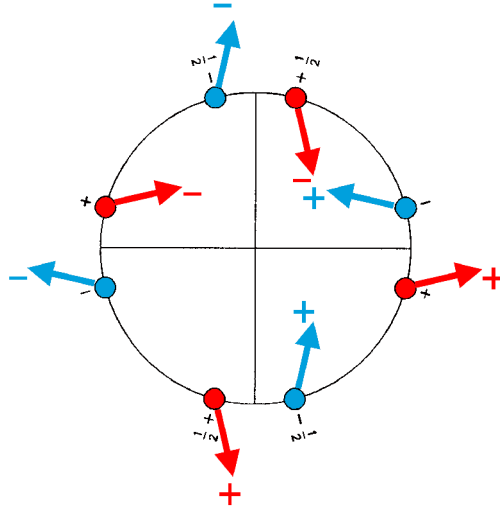
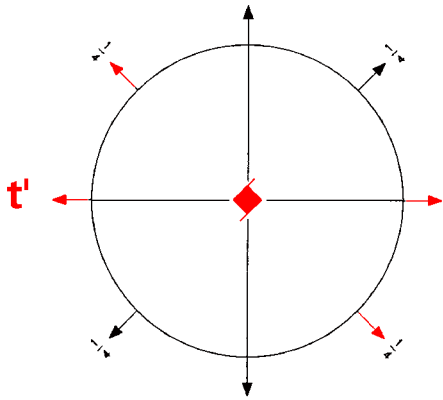
$p_{2c}4_2'22'$

4221'

Tetragonal

No. 32.6.167

$p_{2c}4_2'22'$



Origin at $22'2'$ at $4_2'21$

Asymmetric unit $0 \leq x; 0 \leq z \leq 1/4$

Symmetry operations

For $(0,0,0)$ + set

(1) 1 (1 0,0,0)	(2) $2'$ 0,0,z (2_z 0,0,0)'	(3) 4^{+} (0,0,1/2) 0,0,z (4_z 0,0,1/2)'	(4) 4^{-} (0,0,1/2) 0,0,z (4_z^{-1} 0,0,1/2)
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(5) $2'$ 0,y,0 (2_y 0,0,0)'	(6) 2 x,0,0 (2_x 0,0,0)	(7) $2'$ x,x,1/4 (2_{xy} 0,0,1/2)'	(8) 2 x, \bar{x} ,1/4 ($2_{\bar{xy}}$ 0,0,1/2)
------------------------------------	----------------------------------	---	---

For $(0,0,1)$ + set

(1) t' (0,0,1) (1 0,0,1)'	(2) 2 (0,0,1) 0,0,z (2_z 0,0,1)	(3) 4^{+} (0,0,3/2) 0,0,z (4_z 0,0,3/2)	(4) 4^{-} (0,0,3/2) 0,0,z (4_z^{-1} 0,0,3/2)'
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(5) 2 0,y,1/2 (2_y 0,0,1)	(6) $2'$ x,0,1/2 (2_x 0,0,1)'	(7) 2 x,x,3/4 (2_{xy} 0,0,3/2)	(8) $2'$ x, \bar{x} ,3/4 ($2_{\bar{xy}}$ 0,0,3/2)'
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Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]
	(3) $\bar{y},x,z+1/2$ [v, \bar{u},\bar{w}]	(4) $y,\bar{x},z+1/2$ [v, \bar{u},w]
	(5) \bar{x},y,\bar{z} [u, \bar{v},w]	(6) x,\bar{y},\bar{z} [u, \bar{v},\bar{w}]
	(7) $y,x,\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]
4 g ..2	$x,x,3/4$ [u, \bar{u},w]	$\bar{x},\bar{x},3/4$ [u, \bar{u},\bar{w}]
	$\bar{x},x,1/4$ [u,u,w]	$x,\bar{x},1/4$ [u,u, \bar{w}]
4 f ..2'	$x,x,1/4$ [u,u,0]	$\bar{x},\bar{x},1/4$ [u,u,0]
	$\bar{x},x,3/4$ [u, $\bar{u},0$]	$x,\bar{x},3/4$ [u, $\bar{u},0$]
4 e .2'	$x,0,1/2$ [0,v,w]	$\bar{x},0,1/2$ [0,v, \bar{w}]
	$0,x,0$ [$\bar{v},0,w$]	$0,\bar{x},0$ [$\bar{v},0,\bar{w}$]
4 d .2.	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [u,0,0]
	$0,x,1/2$ [0, $\bar{u},0$]	$0,\bar{x},1/2$ [0, $\bar{u},0$]
4 c 2'..	$0,0,z$ [u,v,0]	$0,0,z+1/2$ [v, $\bar{u},0$]
	$0,0,\bar{z}$ [u, $\bar{v},0$]	$0,0,\bar{z}+1/2$ [$\bar{v},\bar{u},0$]
2 b 2'.2'2	$0,0,1/4$ [u, $\bar{u},0$]	$0,0,3/4$ [$\bar{u},\bar{u},0$]
2 a 2'22'.	$0,0,0$ [u,0,0]	$0,0,1/2$ [0, $\bar{u},0$]

Continued

No. 32.6.167

$P_{2c} 4_2'22'$

Symmetry of special projections

Along [001] $4mm1'$

Origin at 0,0,z

Along [100] $P_{2a^*} 2m'm'$

$a^* = c$

Origin at x,0,0

Along [110] $P_{2a^*} 2'mm'$

$a^* = c$

Origin at x,x,1/4

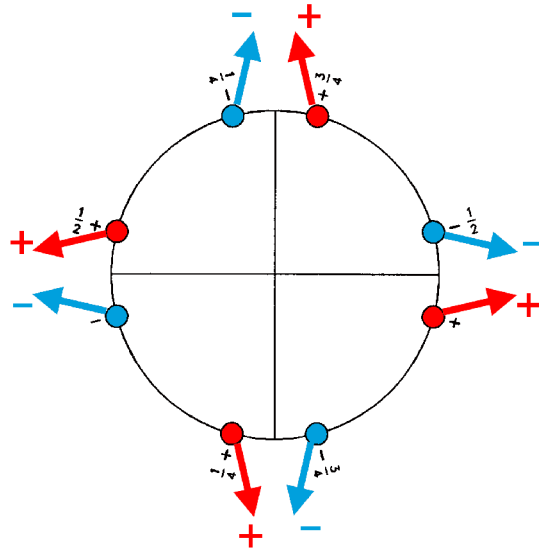
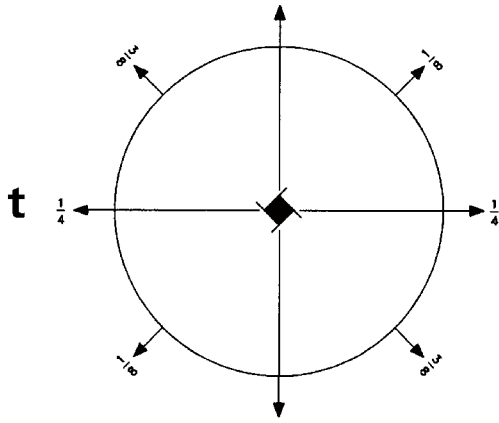
$p4_322$

422

Tetragonal

No. 33.1.168

$p4_322$



Origin on $2[100]$ at $4_3(2,1)1$

Asymmetric unit $0 \leq z \leq 1/8$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,3/4) 0,0,z
(4 _z 0,0,3/4) | (4) 4 ⁻ (0,0,1/4) 0,0,z
(4 _z ⁻¹ 0,0,1/4) |
| (5) 2 x,0,0
(2 _x 0,0,0) | (6) 2 0,y,1/4
(2 _y 0,0,1/2) | (7) 2 x,x,3/8
(2 _{xy} 0,0,3/4) | (8) 2 x,x̄,1/8
(2 _{x̄y} 0,0,1/4) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 c 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+3/4$ [\bar{v},u,w]	(4) $y,\bar{x},z+1/4$ [v,\bar{u},w]	
	(5) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(6) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	
	(7) $y,x,\bar{z}+3/4$ [v,u,\bar{w}]	(8) $\bar{y},\bar{x},\bar{z}+1/4$ [\bar{v},\bar{u},\bar{w}]	
	4 b ..2	$x,x,7/8$ [u,u,0]	$\bar{x},\bar{x},3/8$ [$\bar{u},\bar{u},0$]
		$\bar{x},x,5/8$ [$\bar{u},u,0$]	$x,\bar{x},1/8$ [u, $\bar{u},0$]
	4 a .2.	$x,0,0$ [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]
$0,x,3/4$ [0,u,0]		$0,\bar{x},1/4$ [0, $\bar{u},0$]	

Symmetry of special projections

Along [001] 4m'm'	Along [100] p2m'g' a* = c	Along [110] p2m'g' a* = c
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,3/8

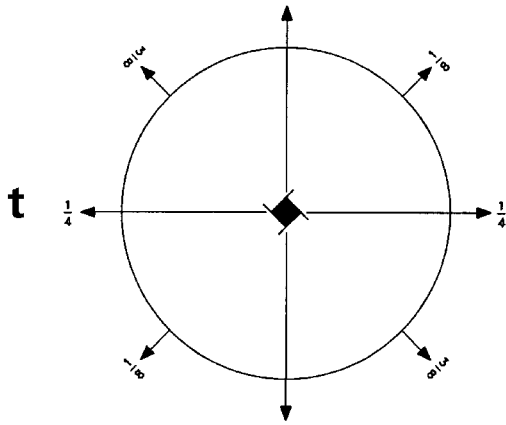
$p4_3221'$

4221'

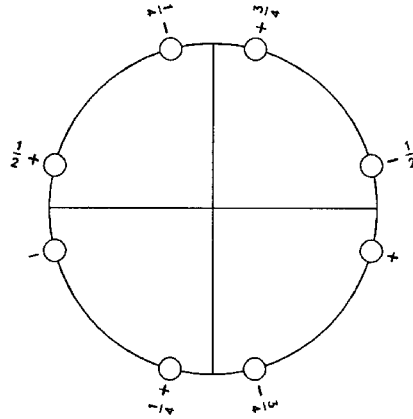
Tetragonal

No. 33.2.169

$p4_3221'$



1'



Origin on $21'[100]$ at $4_3(2,1)11'$

Asymmetric unit $0 \leq z \leq 1/8$

Symmetry operations

For 1 + set

(1) 1 (1 0,0,0)	(2) 2 (0,0,1/2) (2 _z 0,0,1/2)	0,0,z	(3) 4 ⁺ (0,0,3/4) (4 _z 0,0,3/4)	0,0,z	(4) 4 ⁻ (0,0,1/4) (4 _z ⁻¹ 0,0,1/4)	0,0,z
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(5) 2 x,0,0 (2 _x 0,0,0)	(6) 2 0,y,1/4 (2 _y 0,0,1/2)	(7) 2 x,x,3/8 (2 _{xy} 0,0,3/4)	(8) 2 x,x̄,1/8 (2 _{xy} 0,0,1/4)
--	--	---	--

For 1' + set

(1) 1' (1 0,0,0)'	(2) 2' (0,0,1/2) (2 _z 0,0,1/2)'	0,0,z	(3) 4 ⁺ ' (0,0,3/4) (4 _z 0,0,3/4)'	0,0,z	(4) 4 ⁻ ' (0,0,1/4) (4 _z ⁻¹ 0,0,1/4)'	0,0,z
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(5) 2' x,0,0 (2 _x 0,0,0)'	(6) 2' 0,y,1/4 (2 _y 0,0,1/2)'	(7) 2' x,x,3/8 (2 _{xy} 0,0,3/4)'	(8) 2' x,x̄,1/8 (2 _{xy} 0,0,1/4)'
--	--	---	--

Generators selected (1); t(0,0,1); (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
8 c 11'	(1) x,y,z [0,0,0]	(2) $\bar{x},\bar{y},z+1/2$ [0,0,0]
	(3) $\bar{y},x,z+3/4$ [0,0,0]	(4) $y,\bar{x},z+1/4$ [0,0,0]
	(5) x,\bar{y},\bar{z} [0,0,0]	(6) $\bar{x},y,\bar{z}+1/2$ [0,0,0]
	(7) $y,x,\bar{z}+3/4$ [0,0,0]	(8) $\bar{y},\bar{x},\bar{z}+1/4$ [0,0,0]
4 b ..21'	x,x,7/8 [0,0,0]	$\bar{x},\bar{x},3/8$ [0,0,0]
	$\bar{x},x,5/8$ [0,0,0]	x, $\bar{x},1/8$ [0,0,0]
4 a .2.1'	x,0,0 [0,0,0]	$\bar{x},0,1/2$ [0,0,0]
	0,x,3/4 [0,0,0]	0, $\bar{x},1/4$ [0,0,0]

Symmetry of special projections

Along [001] 4mm1'	Along [100] p2mg1'	Along [110] p2mg1'
Origin at 0,0,z	a* = c Origin at x,0,0	a* = c Origin at x,x,3/8

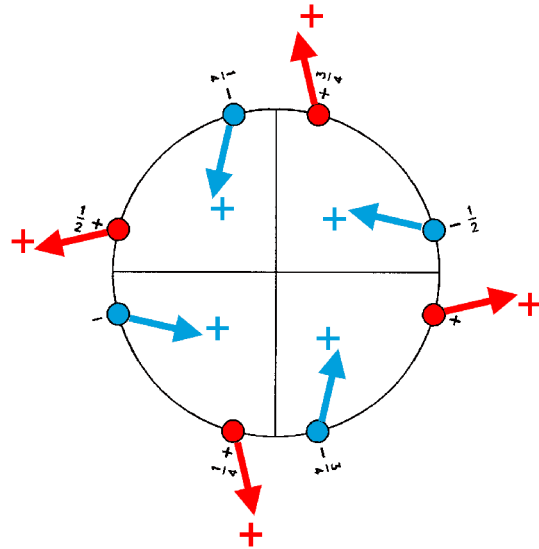
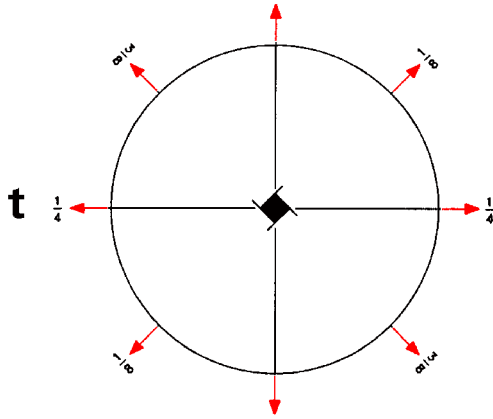
$p4_32'2'$

$42'2'$

Tetragonal

No. 33.3.170

$p4_32'2'$



Origin on $2'[100]$ at $4_3(2',1)1$

Asymmetric unit $0 \leq z \leq 1/8$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,3/4) 0,0,z
(4 _z 0,0,3/4) | (4) 4 ⁻ (0,0,1/4) 0,0,z
(4 _z ⁻¹ 0,0,1/4) |
| (5) 2' x,0,0
(2 _x 0,0,0)' | (6) 2' 0,y,1/4
(2 _y 0,0,1/2)' | (7) 2' x,x,3/8
(2 _{xy} 0,0,3/4)' | (8) 2' x, \bar{x} ,1/8
(2 _{\bar{xy}} 0,0,1/4)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 c 1	(1) x, y, z [u,v,w]	(2) $\bar{x}, \bar{y}, z+1/2$ [\bar{u}, \bar{v}, w]	
	(3) $\bar{y}, x, z+3/4$ [\bar{v}, u, w]	(4) $y, \bar{x}, z+1/4$ [v, \bar{u}, w]	
	(5) x, \bar{y}, \bar{z} [\bar{u}, v, w]	(6) $\bar{x}, y, \bar{z}+1/2$ [u, \bar{v}, w]	
	(7) $y, x, \bar{z}+3/4$ [\bar{v}, \bar{u}, w]	(8) $\bar{y}, \bar{x}, \bar{z}+1/4$ [v, u, w]	
	4 b ..2'	$x, x, 7/8$ [u, \bar{u} ,w]	$\bar{x}, \bar{x}, 3/8$ [\bar{u}, u, w]
		$\bar{x}, x, 5/8$ [u,u,w]	$x, \bar{x}, 1/8$ [\bar{u}, \bar{u}, w]
	4 a .2'	$x, 0, 0$ [0,v,w]	$\bar{x}, 0, 1/2$ [0, \bar{v}, w]
		$0, x, 3/4$ [$\bar{v}, 0, w$]	$0, \bar{x}, 1/4$ [$v, 0, w$]

Symmetry of special projections

Along [001] 4mm	Along [100] $p2'mg'$ $a^* = c$	Along [110] $p2'mg'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,3/8

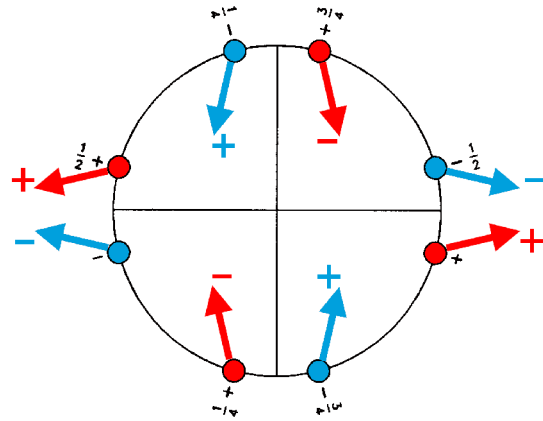
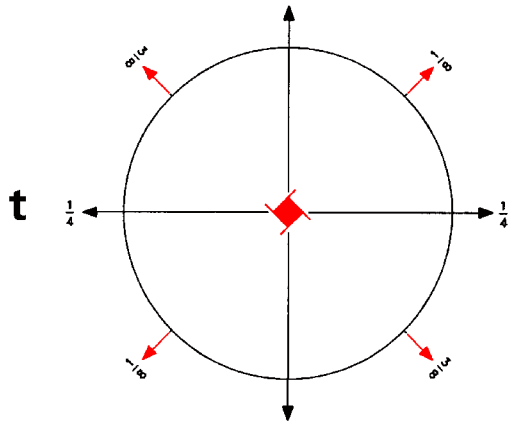
$p4_3'22'$

$4'22'$

Tetragonal

No. 33.4.171

$p4_3'22'$



Origin on $2[100]$ at $4_3'(2,1)1$

Asymmetric unit $0 \leq z \leq 1/8$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,0,1/2) 0,0,z
(2 _z 0,0,1/2) | (3) 4 ⁺ (0,0,3/4) 0,0,z
(4 _z 0,0,3/4)' | (4) 4 ⁻ (0,0,1/4) 0,0,z
(4 _z ⁻¹ 0,0,1/4)' |
| (5) 2 x,0,0
(2 _x 0,0,0) | (6) 2 0,y,1/4
(2 _y 0,0,1/2) | (7) 2' x,x,3/8
(2 _{xy} 0,0,3/4)' | (8) 2' x,x̄,1/8
(2 _{x̄y} 0,0,1/4)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

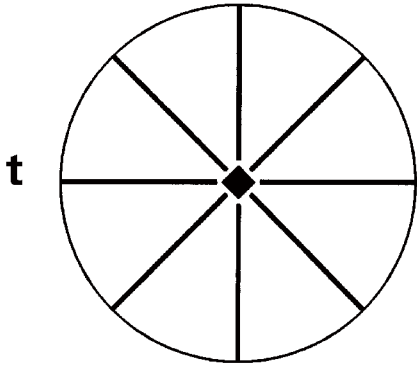
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 c 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+3/4$ [\bar{v},\bar{u},\bar{w}]	(4) $y,\bar{x},z+1/4$ [\bar{v},u,\bar{w}]	
	(5) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(6) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	
	(7) $y,x,\bar{z}+3/4$ [\bar{v},\bar{u},w]	(8) $\bar{y},\bar{x},\bar{z}+1/4$ [v,u,w]	
	4 b ..2'	$x,x,7/8$ [u, \bar{u},w]	$\bar{x},\bar{x},3/8$ [\bar{u},u,w]
		$\bar{x},x,5/8$ [\bar{u},\bar{u},\bar{w}]	$x,\bar{x},1/8$ [u, u,\bar{w}]
	4 a .2.	$x,0,0$ [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]
		$0,x,3/4$ [0, $\bar{u},0$]	$0,\bar{x},1/4$ [0,u,0]

Symmetry of special projections

Along [001] $4'm'm$ Origin at 0,0,z	Along [100] $p2m'g'$ $a^* = c$ Origin at x,0,0	Along [110] $p2'mg'$ $a^* = c$ Origin at x,x,3/8
--	--	--

$p4mm$

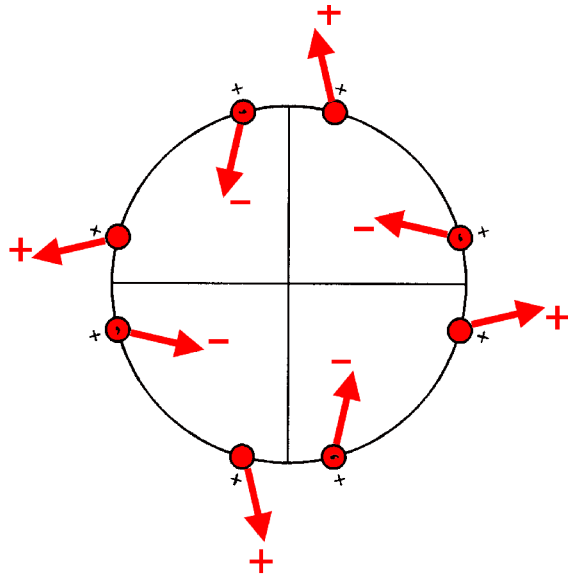
No. 34.1.172



$4mm$

$p4mm$

Tetragonal



Origin on $4mm$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

- | | | | |
|--------------------------------------|--------------------------------------|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^+ $0,0,z$
(4_z 0,0,0) | (4) 4^- $0,0,z$
(4_z^{-1} 0,0,0) |
| (5) m_x $x,0,z$
(m_y 0,0,0) | (6) m_y $0,y,z$
(m_x 0,0,0) | (7) m_x x,\bar{x},z
(m_{xy} 0,0,0) | (8) m_x x,x,z
($m_{\bar{xy}}$ 0,0,0) |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

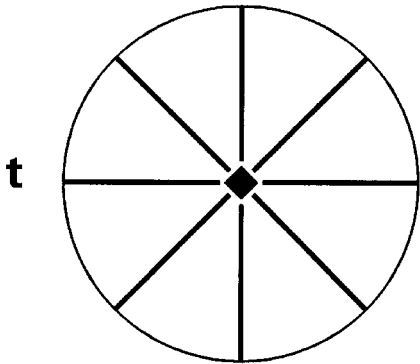
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 d 1	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]	
	(3) \bar{y}, x, z [\bar{v}, u, w]	(4) y, \bar{x}, z [v, \bar{u}, w]	
	(5) x, \bar{y}, z [\bar{u}, v, \bar{w}]	(6) \bar{x}, y, z [u, \bar{v}, \bar{w}]	
	(7) \bar{y}, \bar{x}, z [v,u, \bar{w}]	(8) y, x, z [$\bar{v}, \bar{u}, \bar{w}$]	
	4 c .m.	$x, 0, z$ [0,v,0]	$\bar{x}, 0, z$ [0, $\bar{v}, 0$]
		$0, x, z$ [$\bar{v}, 0, 0$]	$0, \bar{x}, z$ [v,0,0]
	4 b ..m	x, x, z [u, $\bar{u}, 0$]	\bar{x}, \bar{x}, z [$\bar{u}, u, 0$]
		\bar{x}, x, z [u,u,0]	x, \bar{x}, z [$\bar{u}, \bar{u}, 0$]
1 a 4mm	$0, 0, z$ [0,0,0]		

Symmetry of special projections

Along [001] 4mm	Along [100] $p11m1'$ $a^* = c$	Along [110] $p11m1'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

$p4mm1'$

No. 34.2.173

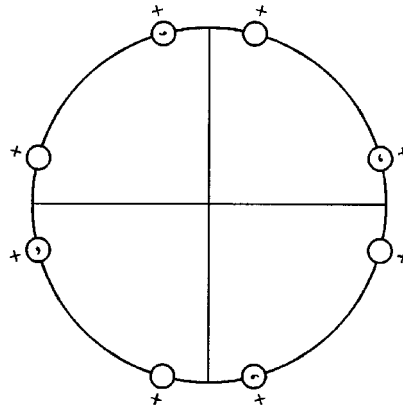


$4mm1'$

$p4mm1'$

Tetragonal

$1'$



Origin on $4mm1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

For $1 +$ set

- | | | | |
|----------------------------------|----------------------------------|---|---|
| (1) 1
$(1 0,0,0)$ | (2) 2 $0,0,z$
$(2_z 0,0,0)$ | (3) 4^+ $0,0,z$
$(4_z 0,0,0)$ | (4) 4^- $0,0,z$
$(4_z^{-1} 0,0,0)$ |
| (5) m $x,0,z$
$(m_y 0,0,0)$ | (6) m $0,y,z$
$(m_x 0,0,0)$ | (7) m x,\bar{x},z
$(m_{xy} 0,0,0)$ | (8) m x,x,z
$(m_{\bar{xy}} 0,0,0)$ |

For $1' +$ set

- | | | | |
|------------------------------------|------------------------------------|---|---|
| (1) $1'$
$(1 0,0,0)'$ | (2) $2'$ $0,0,z$
$(2_z 0,0,0)'$ | (3) $4^{+'}$ $0,0,z$
$(4_z 0,0,0)'$ | (4) $4^{-'}$ $0,0,z$
$(4_z^{-1} 0,0,0)'$ |
| (5) m' $x,0,z$
$(m_y 0,0,0)'$ | (6) m' $0,y,z$
$(m_x 0,0,0)'$ | (7) m' x,\bar{x},z
$(m_{xy} 0,0,0)'$ | (8) m' x,x,z
$(m_{\bar{xy}} 0,0,0)'$ |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); $1'$

Positions

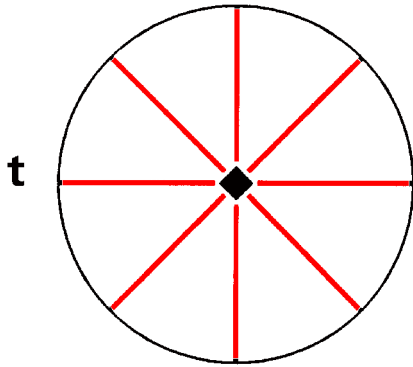
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1'+$
8 d $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $\bar{y},x,z [0,0,0]$	(4) $y,\bar{x},z [0,0,0]$
	(5) $x,\bar{y},z [0,0,0]$	(6) $\bar{x},y,z [0,0,0]$
	(7) $\bar{y},\bar{x},z [0,0,0]$	(8) $y,x,z [0,0,0]$
4 c $.m.1'$	$x,0,z [0,0,0]$	$\bar{x},0,z [0,0,0]$
	$0,x,z [0,0,0]$	$0,\bar{x},z [0,0,0]$
4 b $..m1'$	$x,x,z [0,0,0]$	$\bar{x},\bar{x},z [0,0,0]$
	$\bar{x},x,z [0,0,0]$	$x,\bar{x},z [0,0,0]$
1 a $4mm1'$	$0,0,z [0,0,0]$	

Symmetry of special projections

Along $[001]$ $4mm1'$	Along $[100]$ $p11m1'$	Along $[110]$ $p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

$p4m'm'$

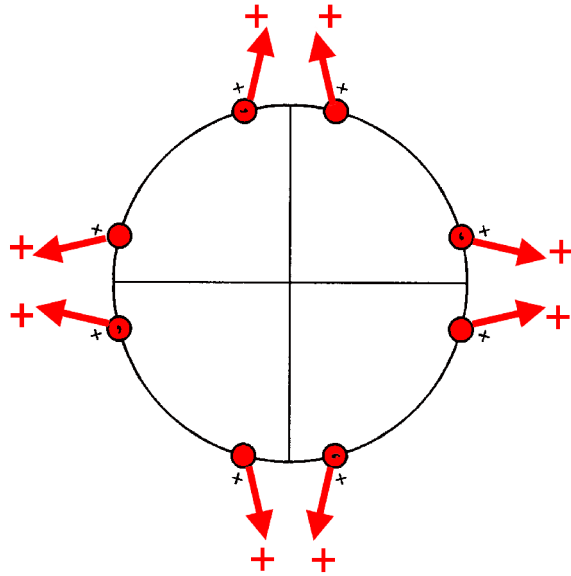
No. 34.3.174



$4m'm'$

$p4m'm'$

Tetragonal



Origin on $4m'm'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2_{0,0,z}$
(2_z |0,0,0)

(3) 4^+ $0,0,z$
(4_z |0,0,0)

(4) 4^- $0,0,z$
(4_z^{-1} |0,0,0)

(5) m'_x $x,0,z$
(m_y |0,0,0)'

(6) m'_y $0,y,z$
(m_x |0,0,0)'

(7) m'_x x,\bar{x},z
(m_{xy} |0,0,0)'

(8) m'_y x,x,z
($m_{\bar{xy}}$ |0,0,0)'

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

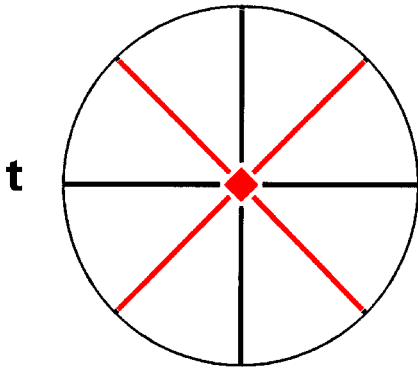
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 d 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]	
	(5) x, \bar{y},z [u, \bar{v},w]	(6) \bar{x},y,z [\bar{u},v,w]	
	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]	
	4 c .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]
		0,x,z [0,u,w]	0, \bar{x},z [0, \bar{u},w]
	4 b ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]
		\bar{x},x,z [\bar{u},u,w]	x, \bar{x},z [u, \bar{u},w]
1 a 4m'm'	0,0,z [0,0,w]		

Symmetry of special projections

Along [001] 4m'm'	Along [100] p11m'	Along [110] p11m'
Origin at 0,0,z	a* = c Origin at x,0,0	a* = c Origin at x,x,0

$p4'mm'$

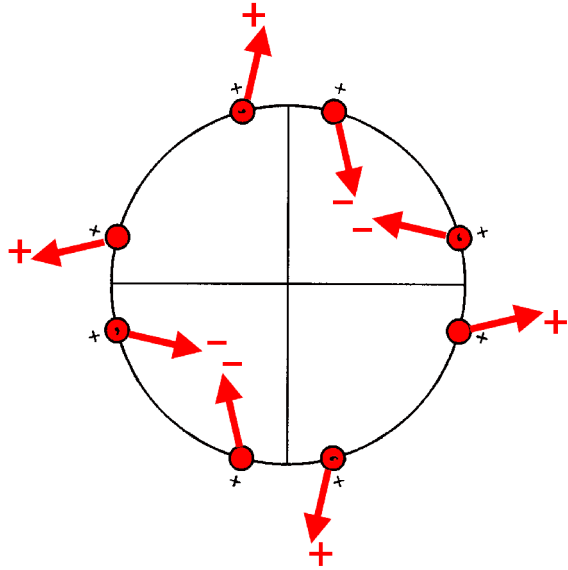
No. 34.4.175



$4'mm'$

$p4'mm'$

Tetragonal



Origin on $4'mm'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) m x,0,z
(m _y 0,0,0) | (6) m 0,y,z
(m _x 0,0,0) | (7) m' x, \bar{x} ,z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{\bar{xy}} 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

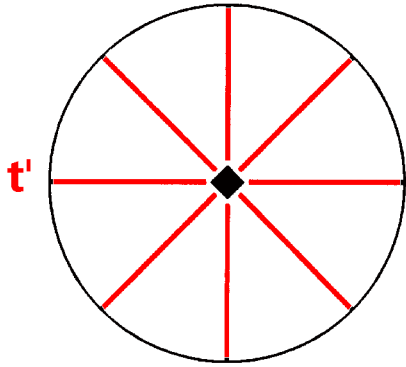
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
8 d 1	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]
	(5) x,\bar{y},z [\bar{u},v,\bar{w}]	(6) \bar{x},y,z [u,\bar{v},\bar{w}]
	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]
4 c .m.	$x,0,z$ [$0,v,0$]	$\bar{x},0,z$ [$0,\bar{v},0$]
	$0,x,z$ [$v,0,0$]	$0,\bar{x},z$ [$\bar{v},0,0$]
4 b ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]
	\bar{x},x,z [u,\bar{u},\bar{w}]	x,\bar{x},z [\bar{u},u,\bar{w}]
1 a 4'mm'	$0,0,z$ [$0,0,0$]	

Symmetry of special projections

Along [001] $4'mm'$	Along [100] $p11m1'$	Along [110] $p11m'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

$p_{2c}4m'm'$

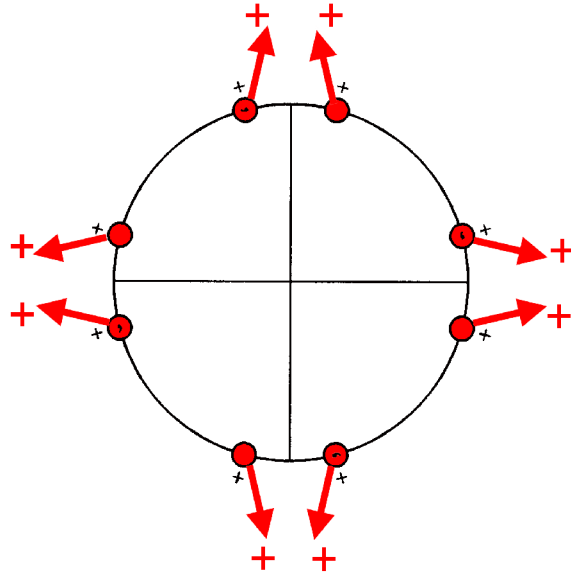
No. 34.5.176



$4mm1'$

$p_{2c}4m'm'$

Tetragonal



Origin on $4m'm'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

For $(0,0,0) +$ set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) m' x,0,z
(m _y 0,0,0)' | (6) m' 0,y,z
(m _x 0,0,0)' | (7) m' x,x̄,z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{xy} 0,0,0)' |

For $(0,0,1)'$ + set

- | | | | |
|--|--|--|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2' (0,0,1) 0,0,z
(2 _z 0,0,1)' | (3) 4 ⁺ ' (0,0,1) 0,0,z
(4 _z 0,0,1)' | (4) 4 ⁻ ' (0,0,1) 0,0,z
(4 _z ⁻¹ 0,0,1)' |
| (5) c (0,0,1) x,0,z
(m _y 0,0,1) | (6) c (0,0,1) 0,y,z
(m _x 0,0,1) | (7) c (0,0,1) x,x̄,z
(m _{xy} 0,0,1) | (8) c (0,0,1) x,x,z
(m _{xy} 0,0,1) |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)'+
8 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $\bar{y},x,z [\bar{v},u,w]$	(4) $y,\bar{x},z [v,\bar{u},w]$
	(5) $x,\bar{y},z [u,\bar{v},w]$	(6) $\bar{x},y,z [\bar{u},v,w]$
	(7) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(8) $y,x,z [v,u,w]$
4 c .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$
	$0,x,z [0,u,w]$	$0,\bar{x},z [0,\bar{u},w]$
4 b ..m'	$x,x,z [u,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
	$\bar{x},x,z [\bar{u},u,w]$	$x,\bar{x},z [u,\bar{u},w]$
1 a 4m'm'	$0,0,z [0,0,w]$	

Symmetry of special projections

Along [001] $4mm1'$	Along [100] $p_{2a^*} 11m'$	Along [110] $p_{2a^*} 11m'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

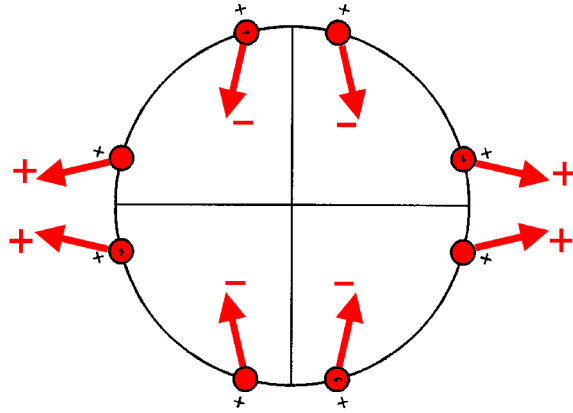
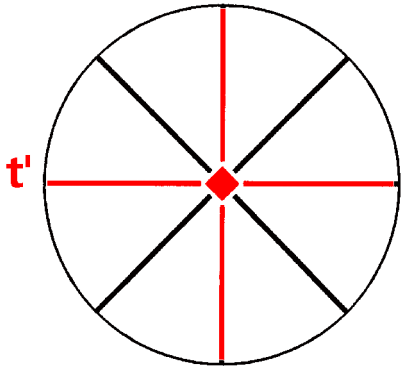
$\rho_{2c}4'm'm$

No. 34.6.177

$4mm1'$

$\rho_{2c}4'm'm$

Tetragonal



Origin on $4'm'm$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

For $(0,0,0) +$ set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) m' x,0,z
(m _y 0,0,0)' | (6) m' 0,y,z
(m _x 0,0,0)' | (7) m x, \bar{x} , z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{\bar{xy}} 0,0,0) |

For $(0,0,1)'$ + set

- | | | | |
|--|--|--|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2' (0,0,1) 0,0,z
(2 _z 0,0,1)' | (3) 4 ⁺ (0,0,1) 0,0,z
(4 _z 0,0,1) | (4) 4 ⁻ (0,0,1) 0,0,z
(4 _z ⁻¹ 0,0,1) |
| (5) c (0,0,1) x,0,z
(m _y 0,0,1) | (6) c (0,0,1) 0,y,z
(m _x 0,0,1) | (7) c' (0,0,1) x, \bar{x} , z
(m _{xy} 0,0,1)' | (8) c' (0,0,1) x,x,z
(m _{\bar{xy}} 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

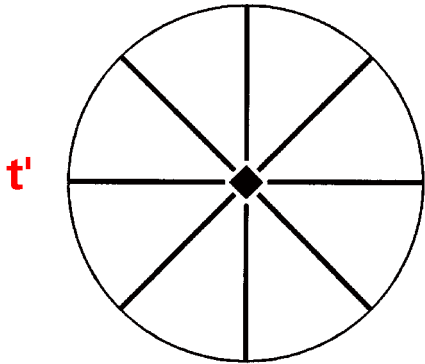
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
8 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $\bar{y},x,z [v,\bar{u},\bar{w}]$	(4) $y,\bar{x},z [\bar{v},u,\bar{w}]$
	(5) $x,\bar{y},z [u,\bar{v},w]$	(6) $\bar{x},y,z [\bar{u},v,w]$
	(7) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(8) $y,x,z [\bar{v},\bar{u},\bar{w}]$
4 c .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$
	$0,x,z [0,\bar{u},\bar{w}]$	$0,\bar{x},z [0,u,\bar{w}]$
4 b ..m	$x,x,z [u,\bar{u},0]$	$\bar{x},\bar{x},z [\bar{u},u,0]$
	$\bar{x},x,z [\bar{u},\bar{u},0]$	$x,\bar{x},z [u,u,0]$
1 a 4'm'm	$0,0,z [0,0,0]$	

Symmetry of special projections

Along [001] $4mm1'$	Along [100] $p_{2a^*} 11m'$	Along [110] $p11m1'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

$p_{2c}4mm$

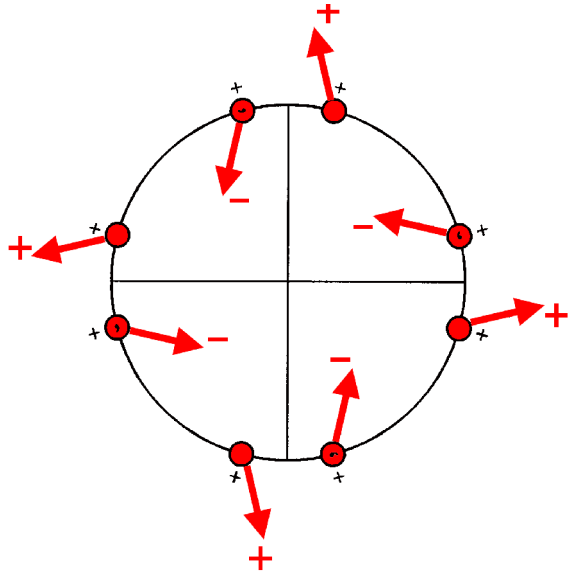
No. 34.7.178



$4mm1'$

$p_{2c}4mm$

Tetragonal



Origin on 4mm

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) m x,0,z
(m _y 0,0,0) | (6) m 0,y,z
(m _x 0,0,0) | (7) m x,x̄,z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{xy} 0,0,0) |

For (0,0,1)' + set

- | | | | |
|--|--|--|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2' (0,0,1) 0,0,z
(2 _z 0,0,1)' | (3) 4 ⁺ ' (0,0,1) 0,0,z
(4 _z 0,0,1)' | (4) 4 ⁻ ' (0,0,1) 0,0,z
(4 _z ⁻¹ 0,0,1)' |
| (5) c' (0,0,1) x,0,z
(m _y 0,0,1)' | (6) c' (0,0,1) 0,y,z
(m _x 0,0,1)' | (7) c' (0,0,1) x,x̄,z
(m _{xy} 0,0,1)' | (8) c' (0,0,1) x,x,z
(m _{xy} 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
8 d 1	(1) x,y,z [u,v,w] (3) \bar{y},x,z [\bar{v},u,w] (5) x,\bar{y},z [\bar{u},v,\bar{w}] (7) \bar{y},\bar{x},z [v,u,\bar{w}]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w] (4) y,\bar{x},z [v,\bar{u},w] (6) \bar{x},y,z [u,\bar{v},\bar{w}] (8) y,x,z [\bar{v},\bar{u},\bar{w}]
4 c .m.	$x,0,z$ [$0,v,0$] $0,x,z$ [$\bar{v},0,0$]	$\bar{x},0,z$ [$0,\bar{v},0$] $0,\bar{x},z$ [$v,0,0$]
4 b ..m	x,x,z [$u,\bar{u},0$] \bar{x},x,z [$u,u,0$]	\bar{x},\bar{x},z [$\bar{u},u,0$] x,\bar{x},z [$\bar{u},\bar{u},0$]
1 a 4mm	$0,0,z$ [$0,0,0$]	

Symmetry of special projections

Along [001] 4mm1'	Along [100] $p11m1'$ $a^* = c$	Along [110] $p11m1'$ $a^* = c$
Origin at 0,0,z	Origin at $x,0,0$	Origin at $x,x,0$

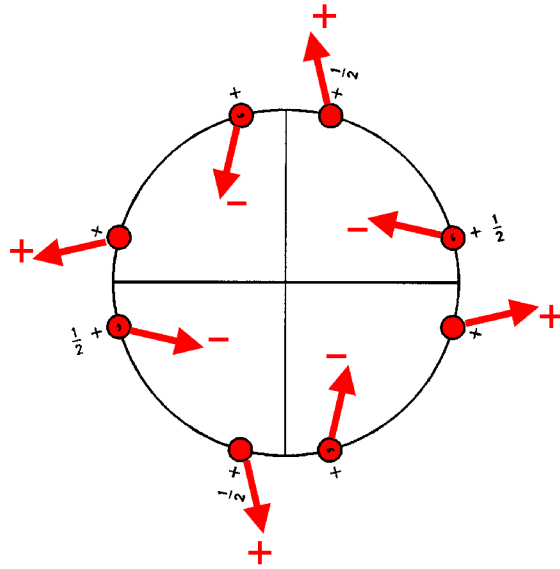
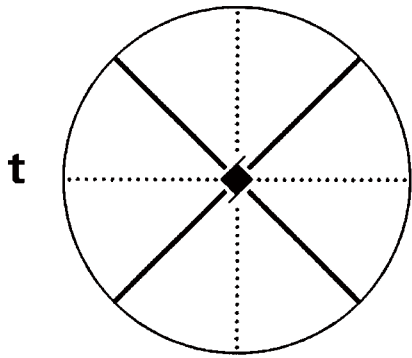
$p4_2cm$

4mm

Tetragonal

No. 35.1.179

$p4_2cm$



Origin on $2mm$ on 4_2cm

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$; $x \leq y$

Symmetry operations

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^+ (0,0,1/2) $0,0,z$
(4_z 0,0,1/2) | (4) 4^- (0,0,1/2) $0,0,z$
(4_z^{-1} 0,0,1/2) |
| (5) c (0,0,1/2) $x,0,z$
(m_y 0,0,1/2) | (6) c (0,0,1/2) $0,y,z$
(m_x 0,0,1/2) | (7) m x,\bar{x},z
(m_{xy} 0,0,0) | (8) m x,x,z
($m_{\bar{xy}}$ 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 c 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [\bar{v},u,w]	(4) $y,\bar{x},z+1/2$ [v,\bar{u},w]	
	(5) $x,\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	(6) $\bar{x},y,z+1/2$ [u,\bar{v},\bar{w}]	
	(7) \bar{y},\bar{x},z [v,u,\bar{w}]	(8) y,x,z [\bar{v},\bar{u},\bar{w}]	
	4 b ..m	x,x,z [u, \bar{u} ,0]	\bar{x},\bar{x},z [$\bar{u},u,0$]
		$\bar{x},x,z+1/2$ [u,u,0]	$x,\bar{x},z+1/2$ [$\bar{u},\bar{u},0$]
	1 a 2.mm	$0,0,z$ [0,0,0]	$0,0,z+1/2$ [0,0,0]

Symmetry of special projections

Along [001] 4mm	Along [100] $p_{2a^*} 11m'$ $a^* = c/2$	Along [110] $p11m'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

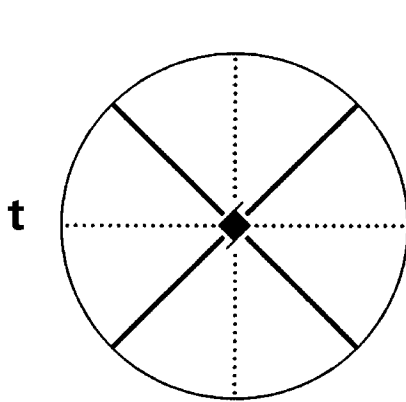
$p4_2cm1'$

$4mm1'$

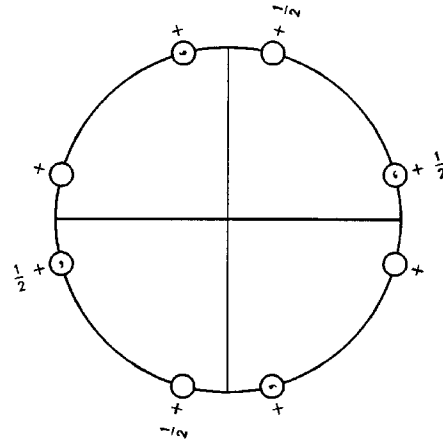
Tetragonal

No. 35.2.180

$p4_2cm1'$



1'



Origin on $2mm1'$ on $4_2cm1'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$; $x \leq y$

Symmetry operations

For $1 +$ set

(1) 1 (1 0,0,0)	(2) 2 0,0,z (2 _z 0,0,0)	(3) 4 ⁺ (0,0,1/2) 0,0,z (4 _z 0,0,1/2)	(4) 4 ⁻ (0,0,1/2) 0,0,z (4 _z ⁻¹ 0,0,1/2)
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(5) c (0,0,1/2) x,0,z (m _y 0,0,1/2)	(6) c (0,0,1/2) 0,y,z (m _x 0,0,1/2)	(7) m x, \bar{x} , z (m _{xy} 0,0,0)	(8) m x,x,z (m _{\bar{xy}} 0,0,0)
--	--	--	--

For $1' +$ set

(1) 1' (1 0,0,0)'	(2) 2' 0,0,z (2 _z 0,0,0)'	(3) 4 ⁺ ' (0,0,1/2) 0,0,z (4 _z 0,0,1/2)'	(4) 4 ⁻ ' (0,0,1/2) 0,0,z (4 _z ⁻¹ 0,0,1/2)'
----------------------	--	--	--

(5) c' (0,0,1/2) x,0,z (m _y 0,0,1/2)'	(6) c' (0,0,1/2) 0,y,z (m _x 0,0,1/2)'	(7) m' x, \bar{x} , z (m _{xy} 0,0,0)'	(8) m' x,x,z (m _{\bar{xy}} 0,0,0)'
--	--	--	--

Generators selected (1); $t(0,0,1)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1' +$
8 c $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $\bar{y},x,z+1/2 [0,0,0]$	(4) $y,\bar{x},z+1/2 [0,0,0]$
	(5) $x,\bar{y},z+1/2 [0,0,0]$	(6) $\bar{x},y,z+1/2 [0,0,0]$
	(7) $\bar{y},\bar{x},z [0,0,0]$	(8) $y,x,z [0,0,0]$
4 b $..m1'$	$x,x,z [0,0,0]$	$\bar{x},\bar{x},z [0,0,0]$
	$\bar{x},x,z+1/2 [0,0,0]$	$x,\bar{x},z+1/2 [0,0,0]$
1 a $2.mm1'$	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$

Symmetry of special projections

Along [001] $4mm1'$	Along [100] $p11m1'$	Along [110] $p11m1'$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

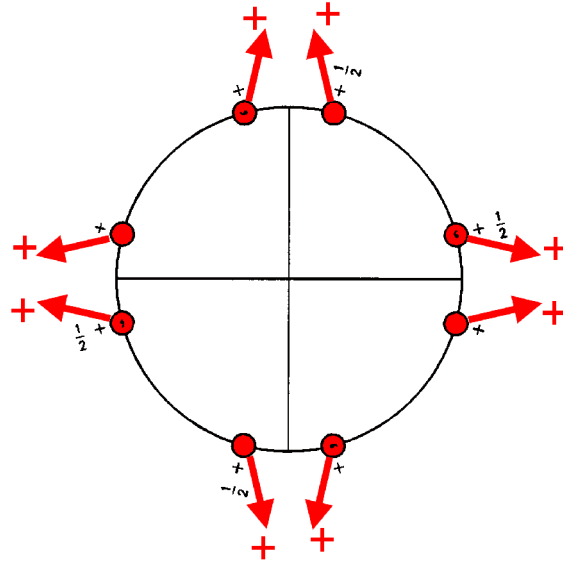
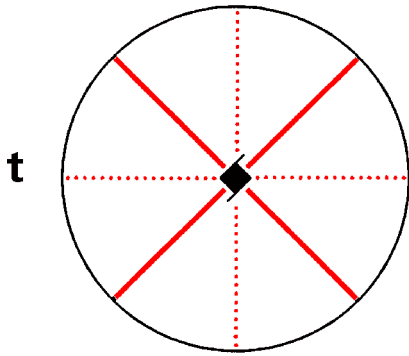
$p4_2c'm'$

$4m'm'$

Tetragonal

No. 35.3.181

$p4_2c'm'$



Origin on $2m'm'$ on $4_2c'm'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$; $x \leq y$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) $0,0,z$
(4 _z 0,0,1/2) | (4) 4 ⁻ (0,0,1/2) $0,0,z$
(4 _z ⁻¹ 0,0,1/2) |
| (5) c' (0,0,1/2) $x,0,z$
(m _y 0,0,1/2)' | (6) c' (0,0,1/2) $0,y,z$
(m _x 0,0,1/2)' | (7) m' x,\bar{x},z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{xy} 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 c 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [\bar{v},u,w]	(4) $y,\bar{x},z+1/2$ [v,\bar{u},w]	
	(5) $x,\bar{y},z+1/2$ [u,\bar{v},w]	(6) $\bar{x},y,z+1/2$ [\bar{u},v,w]	
	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]	
	4 b ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]
		$\bar{x},x,z+1/2$ [\bar{u},u,w]	$x,\bar{x},z+1/2$ [u,\bar{u},w]
	1 a 2.m'm'	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0,w]

Symmetry of special projections

Along [001] $4m'm'$	Along [100] $p11m'$	Along [110] $p11m'$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

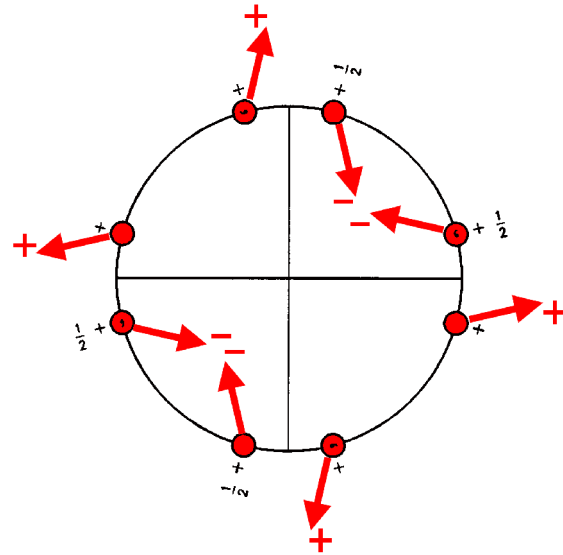
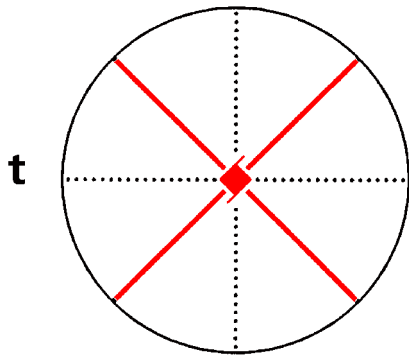
$p4_2'cm'$

No. 35.4.182

$4'mm'$

$p4_2'cm'$

Tetragonal



Origin on $2m'm'$ on $4_2'cm'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) $0,0,z$
(4 _z 0,0,1/2)' | (4) 4 ⁻ (0,0,1/2) $0,0,z$
(4 _z ⁻¹ 0,0,1/2)' |
| (5) c (0,0,1/2) $x,0,z$
(m _y 0,0,1/2) | (6) c (0,0,1/2) $0,y,z$
(m _x 0,0,1/2) | (7) m' x,\bar{x},z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{xy} 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 c 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [v, \bar{u},\bar{w}]	(4) $y,\bar{x},z+1/2$ [\bar{v},u,\bar{w}]	
	(5) $x,\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	(6) $\bar{x},y,z+1/2$ [u, \bar{v},\bar{w}]	
	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]	
	4 b ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]
		$\bar{x},x,z+1/2$ [u, \bar{u},\bar{w}]	$x,\bar{x},z+1/2$ [\bar{u},u,\bar{w}]
	1 a 2.m'm'	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0, \bar{w}]

Symmetry of special projections

Along [001] $4'mm'$	Along [100] $p_{2a^*}11m'$	Along [110] $p11m'$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

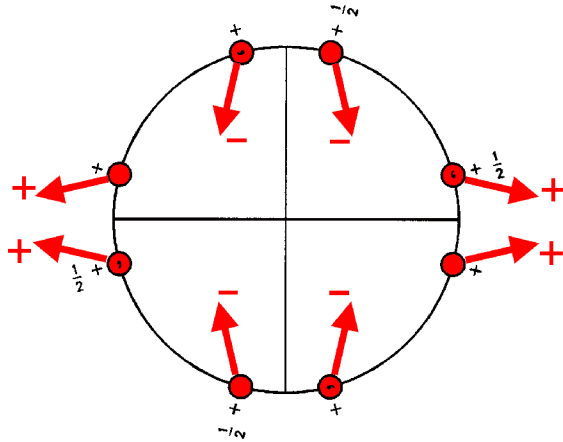
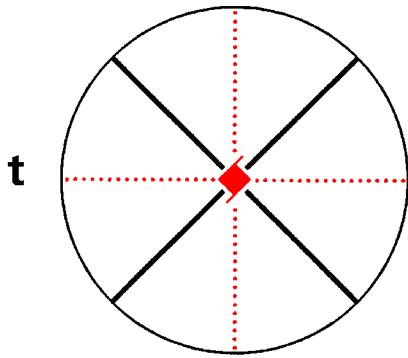
$p4_2'c'm$

No. 35.5.183

$4'm'm$

$p4_2'c'm$

Tetragonal



Origin on $2mm$ on $4_2'c'm$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2)' | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2)' |
| (5) c' (0,0,1/2) x,0,z
(m _y 0,0,1/2)' | (6) c' (0,0,1/2) 0,y,z
(m _x 0,0,1/2)' | (7) m x,x̄,z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{xy} 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 c 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) $\bar{y},x,z+1/2$ [v, \bar{u},\bar{w}]	(4) $y,\bar{x},z+1/2$ [\bar{v},u,\bar{w}]	
	(5) $x,\bar{y},z+1/2$ [u, \bar{v},w]	(6) $\bar{x},y,z+1/2$ [\bar{u},v,w]	
	(7) \bar{y},\bar{x},z [v,u, \bar{w}]	(8) y,x,z [\bar{v},\bar{u},\bar{w}]	
	4 b ..m	x,x,z [u, $\bar{u},0$]	\bar{x},\bar{x},z [$\bar{u},u,0$]
		$\bar{x},x,z+1/2$ [$\bar{u},\bar{u},0$]	$x,\bar{x},z+1/2$ [u,u,0]
	1 a 2.mm	$0,0,z$ [0,0,0]	$0,0,z+1/2$ [0,0,0]

Symmetry of special projections

Along [001] $4'm'm$	Along [100] $p11m'$	Along [110] $p11m1'$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

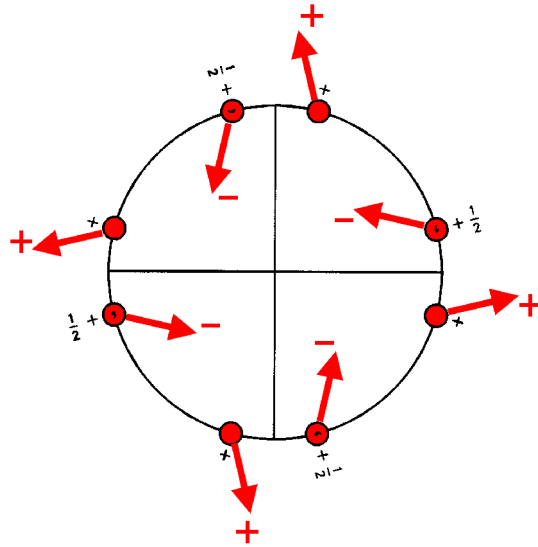
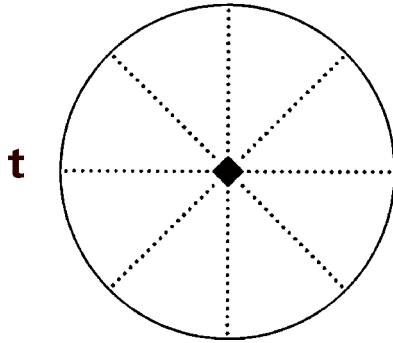
$p4cc$

$4mm$

Tetragonal

No. 36.1.184

$p4cc$



Origin on $4cc$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2_{0,0,z}$
(2_z |0,0,0)

(3) 4^+ $0,0,z$
(4_z |0,0,0)

(4) 4^- $0,0,z$
(4_z^{-1} |0,0,0)

(5) $c(0,0,1/2)$ $x,0,z$
(m_y |0,0,1/2)

(6) $c(0,0,1/2)$ $0,y,z$
(m_x |0,0,1/2)

(7) $c(0,0,1/2)$ x,\bar{x},z
(m_{xy} |0,0,1/2)

(8) $c(0,0,1/2)$ x,x,z
($m_{\bar{xy}}$ |0,0,1/2)

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u, v, w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]
8 b 1	(3) \bar{y}, x, z [\bar{v}, u, w]	(4) y, \bar{x}, z [v, \bar{u}, w]
	(5) $x, \bar{y}, z + 1/2$ [\bar{u}, v, \bar{w}]	(6) $\bar{x}, y, z + 1/2$ [u, \bar{v}, \bar{w}]
	(7) $\bar{y}, \bar{x}, z + 1/2$ [v, u, \bar{w}]	(8) $y, x, z + 1/2$ [$\bar{v}, \bar{u}, \bar{w}$]
	1 a 4..	
	0,0,z [0,0,w]	0,0,z + 1/2 [0,0, \bar{w}]

Symmetry of special projections

Along [001] 4mm	Along [100] p_{2a^*} 11m'	Along [110] p_{2a^*} 11m'
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at x,x,0

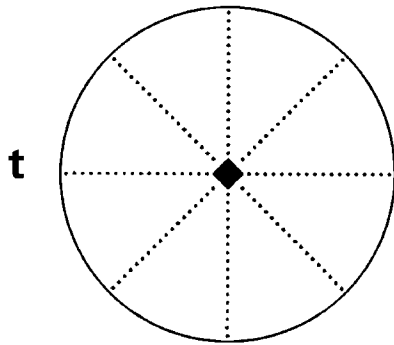
$p4cc1'$

$4mm1'$

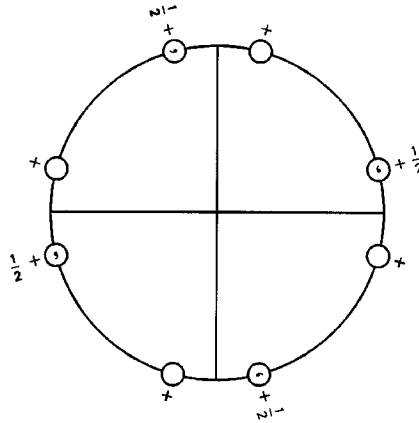
Tetragonal

No. 36.2.185

$p4cc1'$



1'



Origin on $4cc1'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

- | | | | |
|--|--|---|---|
| (1) 1
($1 0,0,0$) | (2) 2 $0,0,z$
($2_z 0,0,0$) | (3) 4^+ $0,0,z$
($4_z 0,0,0$) | (4) 4^- $0,0,z$
($4_z^{-1} 0,0,0$) |
| (5) c $(0,0,1/2)$ $x,0,z$
($m_y 0,0,1/2$) | (6) c $(0,0,1/2)$ $0,y,z$
($m_x 0,0,1/2$) | (7) c $(0,0,1/2)$ x,\bar{x},z
($m_{xy} 0,0,1/2$) | (8) c $(0,0,1/2)$ x,x,z
($m_{\bar{xy}} 0,0,1/2$) |

For $1' +$ set

- | | | | |
|--|--|---|---|
| (1) $1'$
($1 0,0,0$)' | (2) $2'$ $0,0,z$
($2_z 0,0,0$)' | (3) $4^{+'}$ $0,0,z$
($4_z 0,0,0$)' | (4) $4^{-'}$ $0,0,z$
($4_z^{-1} 0,0,0$)' |
| (5) c' $(0,0,1/2)$ $x,0,z$
($m_y 0,0,1/2$)' | (6) c' $(0,0,1/2)$ $0,y,z$
($m_x 0,0,1/2$)' | (7) c' $(0,0,1/2)$ x,\bar{x},z
($m_{xy} 0,0,1/2$)' | (8) c' $(0,0,1/2)$ x,x,z
($m_{\bar{xy}} 0,0,1/2$)' |

Continued

No. 36.2.185

 $p4cc1'$ Generators selected (1); $t(0,0,1)$; (2); (3); (5); $1'$

Positions

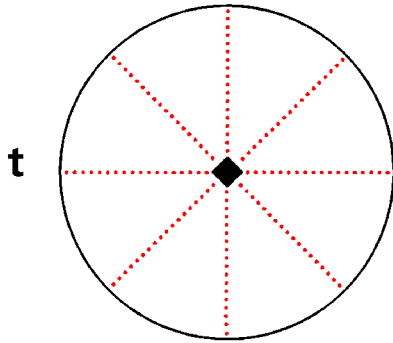
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	$1' +$
8 b $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $\bar{y},x,z [0,0,0]$	(4) $y,\bar{x},z [0,0,0]$
	(5) $x,\bar{y},z+1/2 [0,0,0]$	(6) $\bar{x},y,z+1/2 [0,0,0]$
	(7) $\bar{y},\bar{x},z+1/2 [0,0,0]$	(8) $y,x,z+1/2 [0,0,0]$
1 a $4..1'$	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$

Symmetry of special projections

Along $[001]$ $4mm1'$	Along $[100]$ $p11m1'$ $a^* = c/2$	Along $[110]$ $p11m1'$ $a^* = c/2$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

$p4c'c'$

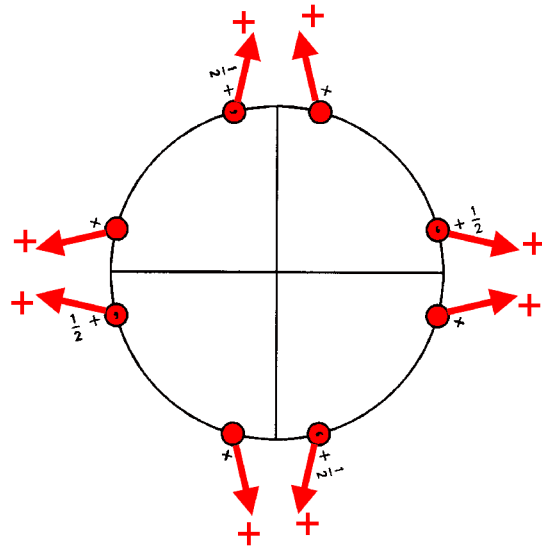
No. 36.3.186



$4m'm'$

$p4c'c'$

Tetragonal



Origin on $4c'c'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2_{0,0,z}$
(2_z |0,0,0)

(3) 4^+ $0,0,z$
(4_z |0,0,0)

(4) 4^- $0,0,z$
(4_z^{-1} |0,0,0)

(5) c' (0,0,1/2) $x,0,z$
(m_y |0,0,1/2)'

(6) c' (0,0,1/2) $0,y,z$
(m_x |0,0,1/2)'

(7) c' (0,0,1/2) x,\bar{x},z
(m_{xy} |0,0,1/2)'

(8) c' (0,0,1/2) x,x,z
($m_{\bar{xy}}$ |0,0,1/2)'

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

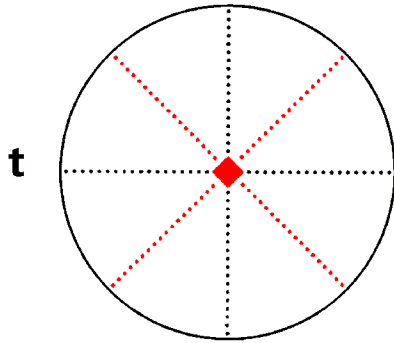
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		(1) x,y,z [u,v,w]
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
	(5) $x,\bar{y},z+1/2$ [u,\bar{v},w]	(6) $\bar{x},y,z+1/2$ [\bar{u},v,w]
	(7) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(8) $y,x,z+1/2$ [v,u,w]
8 b 1		
1 a 4..	$0,0,z$ [$0,0,w$]	$0,0,z+1/2$ [$0,0,w$]

Symmetry of special projections

Along [001] $4m'm'$	Along [100] $p11m'$	Along [110] $p11m'$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c/2$ Origin at $x,x,0$

$p4'cc'$

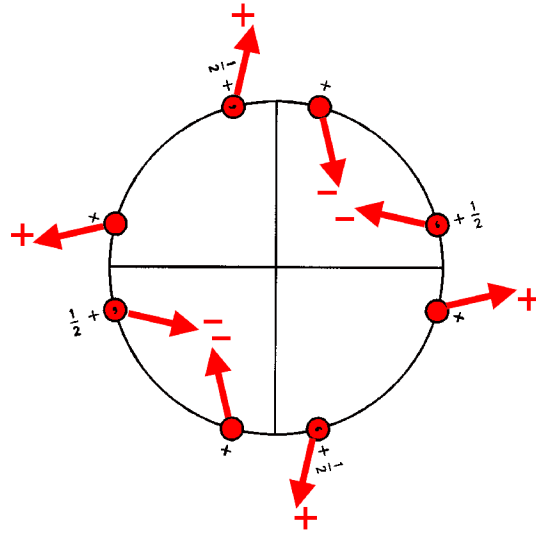
No. 36.4.187



$4'mm'$

$p4'cc'$

Tetragonal



Origin on $4c'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^{+} $0,0,z$
(4_z 0,0,0)' | (4) 4^{-} $0,0,z$
(4_z^{-1} 0,0,0)' |
| (5) c $(0,0,1/2)$ $x,0,z$
(m_y 0,0,1/2) | (6) c $(0,0,1/2)$ $0,y,z$
(m_x 0,0,1/2) | (7) c' $(0,0,1/2)$ x,\bar{x},z
(m_{xy} 0,0,1/2)' | (8) c' $(0,0,1/2)$ x,x,z
($m_{\bar{xy}}$ 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 b 1	(1) x, y, z [u, v, w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]	
	(3) \bar{y}, x, z [v, \bar{u}, \bar{w}]	(4) y, \bar{x}, z [\bar{v}, u, \bar{w}]	
	(5) $x, \bar{y}, z + 1/2$ [\bar{u}, v, \bar{w}]	(6) $\bar{x}, y, z + 1/2$ [u, \bar{v}, \bar{w}]	
	(7) $\bar{y}, \bar{x}, z + 1/2$ [\bar{v}, \bar{u}, w]	(8) $y, x, z + 1/2$ [v, u, w]	
	1 a 4'..	0,0,z [0,0,0]	0,0,z + 1/2 [0,0,0]

Symmetry of special projections

Along [001] 4'mm'	Along [100] $p_{2a^*}11m'$ $a^* = c/2$	Along [110] $p11m'$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

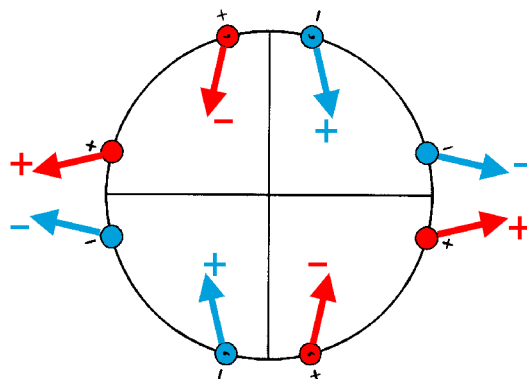
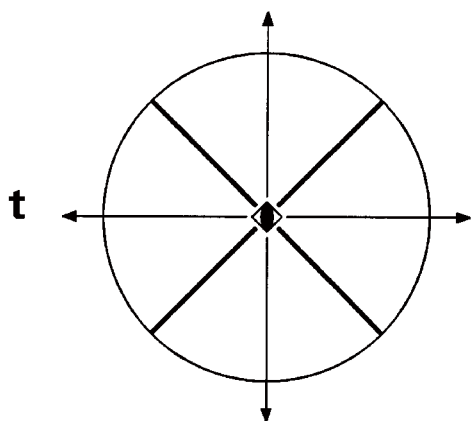
$p\bar{4}2m$

No. 37.1.188

$\bar{4}2m$

$p\bar{4}2m$

Tetragonal



Origin at $\bar{4}2m$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2 $0,y,0$
(2 _y 0,0,0) | (6) 2 $x,0,0$
(2 _x 0,0,0) | (7) m x,\bar{x},z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{\bar{xy}} 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]	
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	
	(7) \bar{y},\bar{x},z [v,u,\bar{w}]	(8) y,x,z [\bar{v},\bar{u},\bar{w}]	
	4 f $\bar{2}m$	x,x,z [$u,\bar{u},0$]	\bar{x},\bar{x},z [$\bar{u},u,0$]
		x,\bar{x},\bar{z} [$u,u,0$]	\bar{x},x,\bar{z} [$\bar{u},\bar{u},0$]
	4 e $\bar{2}$	$x,0,1/2$ [$u,0,0$]	$\bar{x},0,1/2$ [$\bar{u},0,0$]
		$0,\bar{x},1/2$ [$0,u,0$]	$0,x,1/2$ [$0,\bar{u},0$]
4 d $\bar{2}$	$x,0,0$ [$u,0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]	
	$0,\bar{x},0$ [$0,u,0$]	$0,x,0$ [$0,\bar{u},0$]	
2 c $2mm$	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	
1 b $\bar{4}2m$	$0,0,1/2$ [$0,0,0$]		
1 a $\bar{4}2m$	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $4'm'm$	Along [100] $p2'mm'$	Along [110] $p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

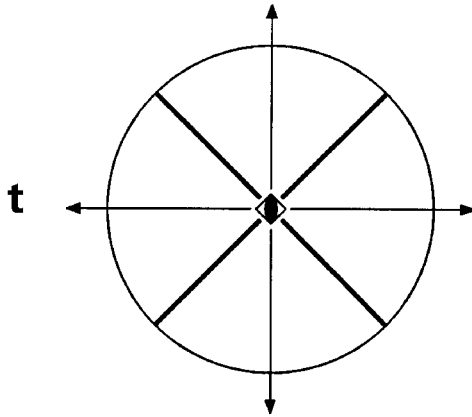
$p\bar{4}2m1'$

No. 37.2.189

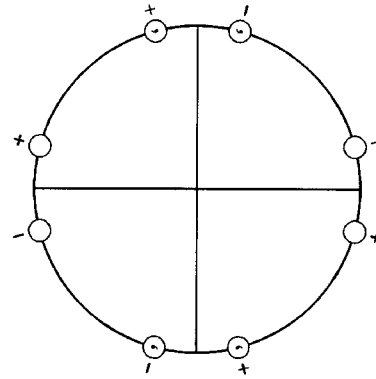
$\bar{4}2m1'$

$p\bar{4}2m1'$

Tetragonal



1'



Origin at $\bar{4}2m1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

For 1 + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) m x, \bar{x} ,z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{\bar{xy}} 0,0,0) |

For 1' + set

- | | | | |
|--|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) $\bar{4}^{+'}$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^{-'}$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) m' x, \bar{x} ,z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{\bar{xy}} 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1'+$
8 g $11'$	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]
	(3) y,\bar{x},\bar{z} [0,0,0]	(4) \bar{y},x,\bar{z} [0,0,0]
	(5) \bar{x},y,\bar{z} [0,0,0]	(6) x,\bar{y},\bar{z} [0,0,0]
	(7) \bar{y},\bar{x},z [0,0,0]	(8) y,x,z [0,0,0]
4 f $.m1'$	x,x,z [0,0,0]	\bar{x},\bar{x},z [0,0,0]
	x,\bar{x},\bar{z} [0,0,0]	\bar{x},x,\bar{z} [0,0,0]
4 e $.2.1'$	$x,0,1/2$ [0,0,0]	$\bar{x},0,1/2$ [0,0,0]
	$0,\bar{x},1/2$ [0,0,0]	$0,x,1/2$ [0,0,0]
4 d $.2.1'$	$x,0,0$ [0,0,0]	$\bar{x},0,0$ [0,0,0]
	$0,\bar{x},0$ [0,0,0]	$0,x,0$ [0,0,0]
2 c $2.mm1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]
1 b $\bar{4}2m1'$	$0,0,1/2$ [0,0,0]	
1 a $\bar{4}2m1'$	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] $4mm1'$	Along [100] $p2mm1'$	Along [110] $p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

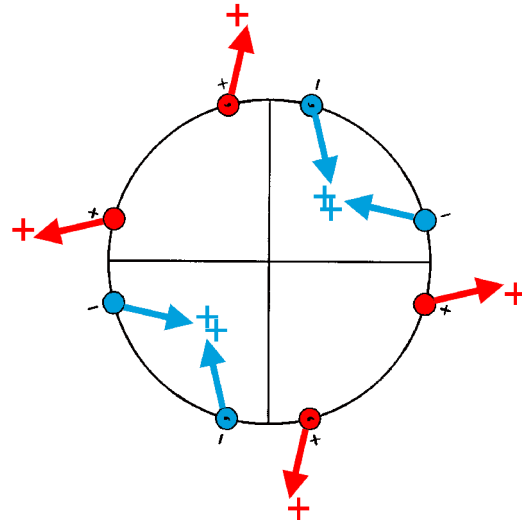
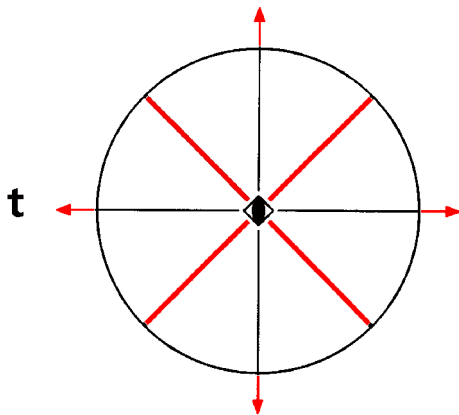
$p\bar{4}2'm'$

No. 37.3.190

$\bar{4}2'm'$

$p\bar{4}2'm'$

Tetragonal



Origin at $\bar{4}2'm'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2' $0,y,0$
(2 _y 0,0,0)' | (6) 2' $x,0,0$
(2 _x 0,0,0)' | (7) m' x,\bar{x},z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{xy} 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

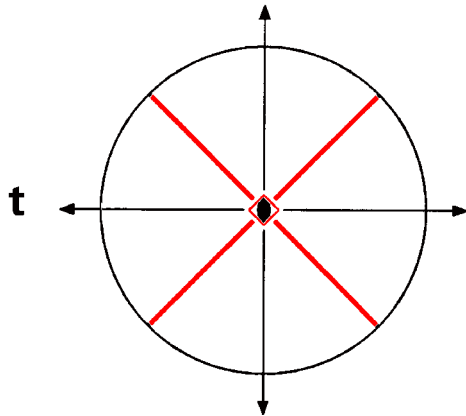
	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]	
	(5) \bar{x},y,\bar{z} [u,\bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	
	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]	
	4 f ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]
		x,\bar{x},\bar{z} [\bar{u},u,w]	\bar{x},x,\bar{z} [u,\bar{u},w]
	4 e .2'	$x,0,1/2$ [$0,v,w$]	$\bar{x},0,1/2$ [$0,\bar{v},w$]
		$0,\bar{x},1/2$ [$\bar{v},0,w$]	$0,x,1/2$ [$v,0,w$]
4 d .2'	$x,0,0$ [$0,v,w$]	$\bar{x},0,0$ [$0,\bar{v},w$]	
	$0,\bar{x},0$ [$\bar{v},0,w$]	$0,x,0$ [$v,0,w$]	
2 c 2.m'm'	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]	
1 b $\bar{4}2'm'$	$0,0,1/2$ [$0,0,w$]		
1 a $\bar{4}2'm'$	$0,0,0$ [$0,0,w$]		

Symmetry of special projections

Along [001] $4'mm'$	Along [100] $p2'mm'$	Along [110] $p11m'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

$p\bar{4}'2m'$

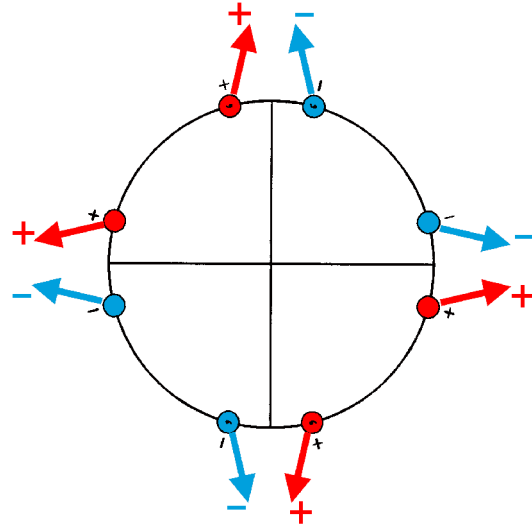
No. 37.4.191



$\bar{4}'2m'$

$p\bar{4}'2m'$

Tetragonal



Origin at $\bar{4}'2m'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) $\bar{4}'^+$ $0,0,z; 0,0,0$
($\bar{4}'_z$ 0,0,0)' | (4) $\bar{4}'^-$ $0,0,z; 0,0,0$
($\bar{4}'_z^{-1}$ 0,0,0)' |
| (5) 2 $0,y,0$
(2 _y 0,0,0) | (6) 2 $x,0,0$
(2 _x 0,0,0) | (7) m' x,\bar{x},z
(m_{xy} 0,0,0)' | (8) m' x,x,z
($m_{\bar{xy}}$ 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]	
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	
	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]	
	4 f ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]
		x,\bar{x},\bar{z} [u,\bar{u},\bar{w}]	\bar{x},x,\bar{z} [\bar{u},u,\bar{w}]
	4 e .2.	$x,0,1/2$ [$u,0,0$]	$\bar{x},0,1/2$ [$\bar{u},0,0$]
		$0,\bar{x},1/2$ [$0,\bar{u},0$]	$0,x,1/2$ [$0,u,0$]
4 d .2.	$x,0,0$ [$u,0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]	
	$0,\bar{x},0$ [$0,\bar{u},0$]	$0,x,0$ [$0,u,0$]	
2 c 2.m'm'	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	
1 b $\bar{4}'2m'$	$0,0,1/2$ [$0,0,0$]		
1 a $\bar{4}'2m'$	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $4m'm'$	Along [100] $p2m'm'$	Along [110] $p11m'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

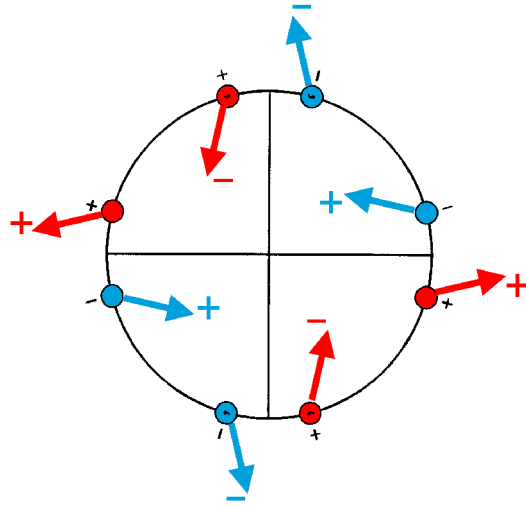
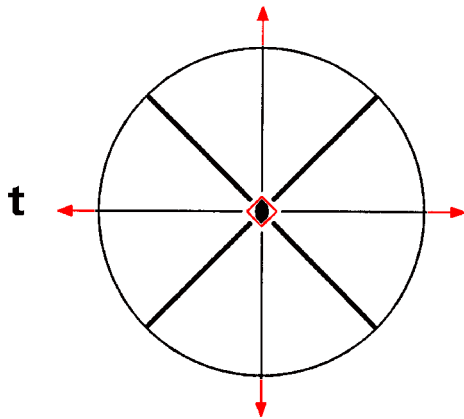
$p\bar{4}'2'm$

No. 37.5.192

$\bar{4}'2'm$

$p\bar{4}'2'm$

Tetragonal



Origin at $\bar{4}'2'm$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) $\bar{4}^{+}$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^{-}$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) 2' $0,y,0$
(2 _y 0,0,0)' | (6) 2' $x,0,0$
(2 _x 0,0,0)' | (7) m x,\bar{x},z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{\bar{xy}} 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]	
	(5) \bar{x},y,\bar{z} [u,\bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	
	(7) \bar{y},\bar{x},z [v,u,\bar{w}]	(8) y,x,z [\bar{v},\bar{u},\bar{w}]	
	4 f $\bar{2}.m$	x,x,z [$u,\bar{u},0$]	\bar{x},\bar{x},z [$\bar{u},u,0$]
		x,\bar{x},\bar{z} [$\bar{u},\bar{u},0$]	\bar{x},x,\bar{z} [$u,u,0$]
	4 e $\bar{2}'$	$x,0,1/2$ [$0,v,w$]	$\bar{x},0,1/2$ [$0,\bar{v},w$]
		$0,\bar{x},1/2$ [$v,0,\bar{w}$]	$0,x,1/2$ [$\bar{v},0,\bar{w}$]
4 d $\bar{2}'$	$x,0,0$ [$0,v,w$]	$\bar{x},0,0$ [$0,\bar{v},w$]	
	$0,\bar{x},0$ [$v,0,\bar{w}$]	$0,x,0$ [$\bar{v},0,\bar{w}$]	
2 c $2.mm$	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	
1 b $\bar{4}'2'm$	$0,0,1/2$ [$0,0,0$]		
1 a $\bar{4}'2'm$	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $4mm$	Along [100] $p2'mm'$	Along [110] $p11m1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

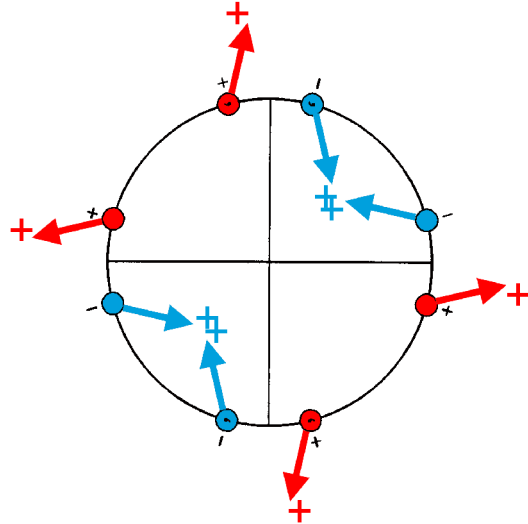
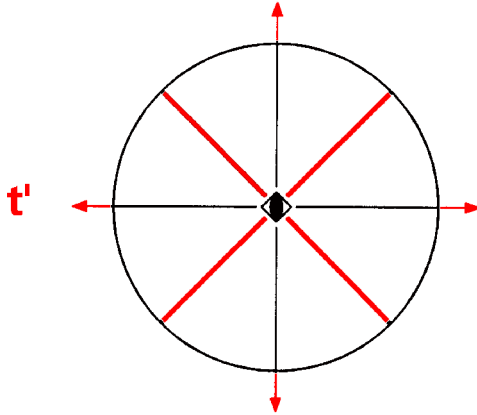
$p_{2c}\bar{4}2'm'$

No. 37.6.193

$\bar{4}2m1'$

$p_{2c}\bar{4}2'm'$

Tetragonal



Origin at $\bar{4}2'm'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) m' x, \bar{x} ,z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{xy} 0,0,0)' |

For (0,0,1)' + set

- | | | | |
|--|--|---|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2' (0,0,1) 0,0,z
(2 _z 0,0,1)' | (3) $\bar{4}^+$ 0,0,z; 0,0,1/2
($\bar{4}_z$ 0,0,1)' | (4) $\bar{4}^-$ 0,0,z; 0,0,1/2
($\bar{4}_z^{-1}$ 0,0,1)' |
| (5) 2 0,y,1/2
(2 _y 0,0,1) | (6) 2 x,0,1/2
(2 _x 0,0,1) | (7) c (0,0,1) x, \bar{x} ,z
(m _{xy} 0,0,1) | (8) c (0,0,1) x,x,z
(m _{xy} 0,0,1) |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
8 g 1	(1) x,y,z [u,v,w] (3) y, \bar{x} , \bar{z} [\bar{v} ,u,w] (5) \bar{x} ,y, \bar{z} [u, \bar{v} ,w] (7) \bar{y} , \bar{x} ,z [\bar{v} , \bar{u} ,w]	(2) \bar{x} , \bar{y} ,z [\bar{u} , \bar{v} ,w] (4) \bar{y} ,x, \bar{z} [v, \bar{u} ,w] (6) x, \bar{y} , \bar{z} [\bar{u} ,v,w] (8) y,x,z [v,u,w]
4 f ..m'	x,x,z [u,u,w] x, \bar{x} , \bar{z} [\bar{u} ,u,w]	\bar{x} , \bar{x} ,z [\bar{u} , \bar{u} ,w] \bar{x} ,x, \bar{z} [u, \bar{u} ,w]
4 e .2.	x,0,1/2 [u,0,0] 0, \bar{x} ,1/2 [0,u,0]	\bar{x} ,0,1/2 [\bar{u} ,0,0] 0,x,1/2 [0, \bar{u} ,0]
4 d .2'	x,0,0 [0,v,w] 0, \bar{x} ,0 [\bar{v} ,0,w]	\bar{x} ,0,0 [0, \bar{v} ,w] 0,x,0 [v,0,w]
2 c 2.m'm'	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]
1 b $\bar{4}2m'$	0,0,1/2 [0,0,0]	
1 a $\bar{4}2m'$	0,0,0 [0,0,w]	

Symmetry of special projections

Along [001] 4mm1'

Origin at 0,0,z

Along [100] $\rho_{2a^*} 2'mm'$ $a^* = c$

Origin at x,0,0

Along [110] $\rho_{2a^*} 11m'$ $a^* = c$

Origin at x,x,0

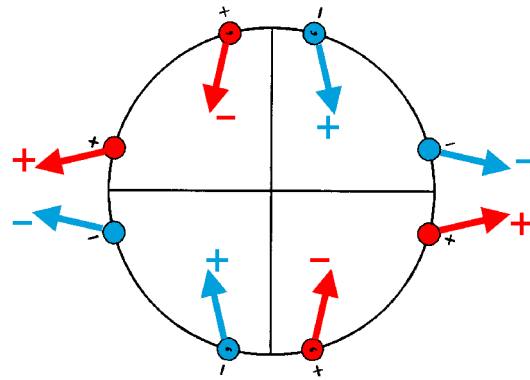
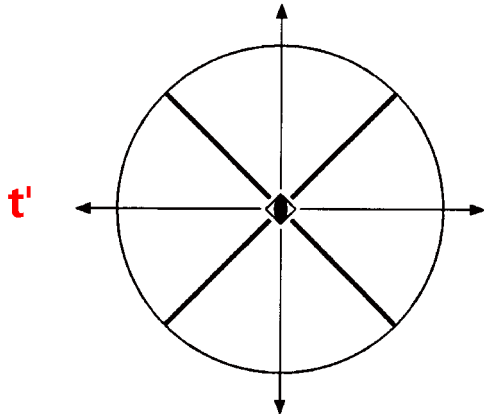
$p_{2c}\bar{4}2m$

$\bar{4}2m$

Tetragonal

No. 37.7.194

$p_{2c}\bar{4}2m$



Origin at $\bar{4}2m$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq y$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) m x, \bar{x} ,z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{xy} 0,0,0) |

For (0,0,1)' + set

- | | | | |
|--|--|---|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2' (0,0,1) 0,0,z
(2 _z 0,0,1)' | (3) $\bar{4}^{+'}$ 0,0,z; 0,0,1/2
($\bar{4}_z$ 0,0,1)' | (4) $\bar{4}^{-'}$ 0,0,z; 0,0,1/2
($\bar{4}_z^{-1}$ 0,0,1)' |
| (5) 2' 0,y,1/2
(2 _y 0,0,1)' | (6) 2' x,0,1/2
(2 _x 0,0,1)' | (7) c' (0,0,1) x, \bar{x} ,z
(m _{xy} 0,0,1)' | (8) c' (0,0,1) x,x,z
(m _{xy} 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,0,1)' +
8 g 1	(1) x,y,z [u,v,w] (3) y, \bar{x} , \bar{z} [\bar{v} ,u,w] (5) \bar{x} ,y, \bar{z} [\bar{u} ,v, \bar{w}] (7) \bar{y} , \bar{x} ,z [v,u, \bar{w}]	(2) \bar{x} , \bar{y} ,z [\bar{u} , \bar{v} ,w] (4) \bar{y} ,x, \bar{z} [v, \bar{u} ,w] (6) x, \bar{y} , \bar{z} [u, \bar{v} , \bar{w}] (8) y,x,z [\bar{v} , \bar{u} , \bar{w}]
4 f ..m	x,x,z [u, \bar{u} ,0] x, \bar{x} , \bar{z} [u,u,0]	\bar{x} , \bar{x} ,z [\bar{u} ,u,0] \bar{x} ,x, \bar{z} [\bar{u} , \bar{u} ,0]
4 e .2'	x,0,1/2 [0,v,w] 0, \bar{x} ,1/2 [v,0, \bar{w}]	\bar{x} ,0,1/2 [0, \bar{v} ,w] 0,x,1/2 [\bar{v} ,0, \bar{w}]
4 d .2.	x,0,0 [u,0,0] 0, \bar{x} ,0 [0,u,0]	\bar{x} ,0,0 [\bar{u} ,0,0] 0,x,0 [0, \bar{u} ,0]
2 c 2.mm	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]
1 b $\bar{4}'2'm$	0,0,1/2 [0,0,0]	
1 a $\bar{4}2m$	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] 4mm1'	Along [100] $p_{2a^*} 2m'm'$	Along [110] $p11m1'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x,0

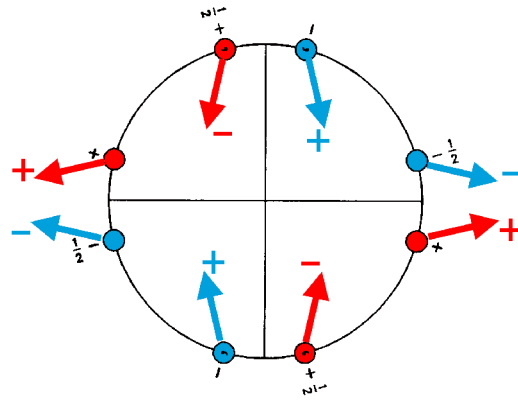
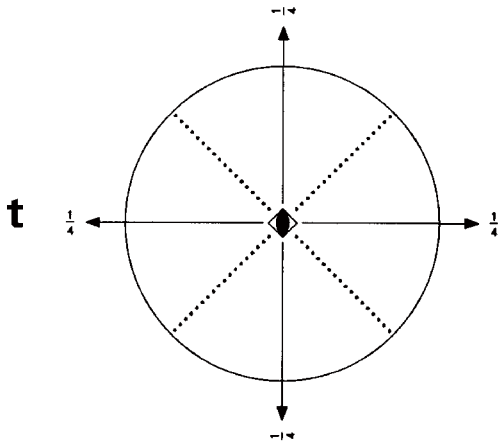
$p\bar{4}2c$

No. 38.1.195

$\bar{4}2m$

$p\bar{4}2c$

Tetragonal



Origin at $\bar{4}1c$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2 $0,y,1/4$
(2 _y 0,0,1/2) | (6) 2 $x,0,1/4$
(2 _x 0,0,1/2) | (7) c $(0,0,1/2) \ x,\bar{x},z$
(m _{xy} 0,0,1/2) | (8) c $(0,0,1/2) \ x,x,z$
(m _{xy} 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1)	(2)
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]
	(5) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	(6) $x,\bar{y},\bar{z}+1/2$ [u,\bar{v},\bar{w}]
	(7) $\bar{y},\bar{x},z+1/2$ [v,u,\bar{w}]	(8) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]
4 e 2..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]
	$0,0,\bar{z}+1/2$ [0,0, \bar{w}]	$0,0,z+1/2$ [0,0, \bar{w}]
4 d .2.	$0,y,1/4$ [0,v,0]	$0,\bar{y},1/4$ [0, $\bar{v},0$]
	$y,0,3/4$ [$\bar{v},0,0$]	$\bar{y},0,3/4$ [$v,0,0$]
4 c .2.	$x,0,1/4$ [u,0,0]	$\bar{x},0,1/4$ [$\bar{u},0,0$]
	$0,\bar{x},3/4$ [0,u,0]	$0,x,3/4$ [0, $\bar{u},0$]
2 b $\bar{4}$..	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0, \bar{w}]
1 a 222.	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]

Symmetry of special projections

Along [001] $4'm'm$	Along [100] $p2m'm'$	Along [110] $p_{2a^*}11m'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,1/4$	$a^* = c/2$ Origin at $x,x,0$

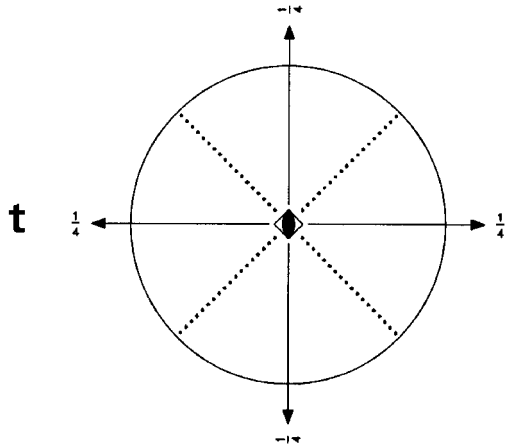
$p\bar{4}2c1'$

$\bar{4}2m1'$

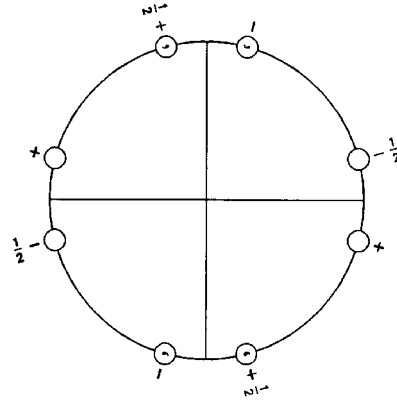
Tetragonal

No. 38.2.196

$p\bar{4}2c1'$



1'



Origin at $\bar{4}1c1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For 1 + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2 0,y,1/4
(2 _y 0,0,1/2) | (6) 2 x,0,1/4
(2 _x 0,0,1/2) | (7) c (0,0,1/2) x, \bar{x} ,z
(m _{xy} 0,0,1/2) | (8) c (0,0,1/2) x,x,z
(m _{xy} 0,0,1/2) |

For 1' + set

- | | | | |
|--|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) $\bar{4}^{+'}$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^{-'}$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) 2' 0,y,1/4
(2 _y 0,0,1/2)' | (6) 2' x,0,1/4
(2 _x 0,0,1/2)' | (7) c' (0,0,1/2) x, \bar{x} ,z
(m _{xy} 0,0,1/2)' | (8) c' (0,0,1/2) x,x,z
(m _{xy} 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1' +$
8 f $11'$	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]
	(3) y,\bar{x},\bar{z} [0,0,0]	(4) \bar{y},x,\bar{z} [0,0,0]
	(5) $\bar{x},y,\bar{z}+1/2$ [0,0,0]	(6) $x,\bar{y},\bar{z}+1/2$ [0,0,0]
	(7) $\bar{y},\bar{x},z+1/2$ [0,0,0]	(8) $y,x,z+1/2$ [0,0,0]
4 e $2..1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]
	$0,0,\bar{z}+1/2$ [0,0,0]	$0,0,z+1/2$ [0,0,0]
4 d $.2.1'$	$0,y,1/4$ [0,0,0]	$0,\bar{y},1/4$ [0,0,0]
	$y,0,3/4$ [0,0,0]	$\bar{y},0,3/4$ [0,0,0]
4 c $.2.1'$	$x,0,1/4$ [0,0,0]	$\bar{x},0,1/4$ [0,0,0]
	$0,\bar{x},3/4$ [0,0,0]	$0,x,3/4$ [0,0,0]
2 b $\bar{4}..1'$	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]
1 a $222.1'$	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]

Symmetry of special projections

Along [001] $4mm1'$	Along [100] $p2mm1'$	Along [110] $p11m1'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,1/4$	$a^* = c/2$ Origin at $x,x,0$

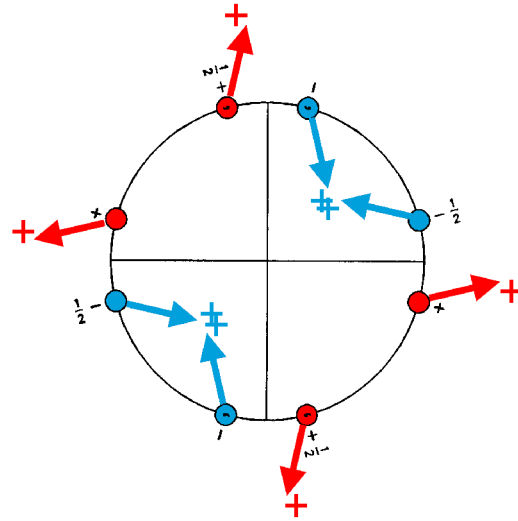
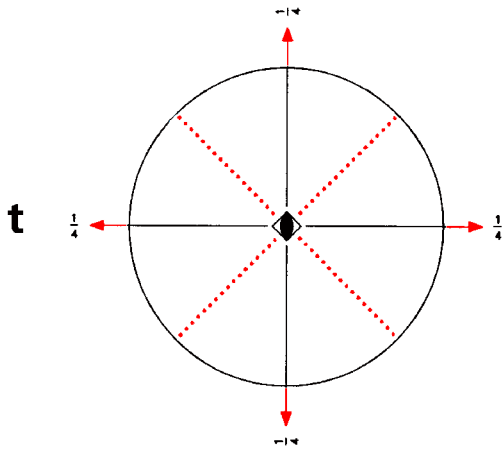
$p\bar{4}2'c'$

No. 38.3.197

$\bar{4}2'm'$

$p\bar{4}2'c'$

Tetragonal



Origin at $\bar{4}1c'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2' $0,y,1/4$
(2 _y 0,0,1/2)' | (6) 2' $x,0,1/4$
(2 _x 0,0,1/2)' | (7) c' $(0,0,1/2) \quad x,\bar{x},z$
(m _{xy} 0,0,1/2)' | (8) c' $(0,0,1/2) \quad x,x,z$
(m _{xy} 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]	
	(5) $\bar{x},y,\bar{z}+1/2$ [u,\bar{v},w]	(6) $x,\bar{y},\bar{z}+1/2$ [\bar{u},v,w]	
	(7) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(8) $y,x,z+1/2$ [v,u,w]	
	4 e 2..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]
		$0,0,\bar{z}+1/2$ [0,0,w]	$0,0,z+1/2$ [0,0,w]
	4 d .2'	$0,y,1/4$ [u,0,w]	$0,\bar{y},1/4$ [$\bar{u},0,w$]
		$y,0,3/4$ [0,u,w]	$\bar{y},0,3/4$ [0, \bar{u},w]
4 c .2'	$x,0,1/4$ [0,v,w]	$\bar{x},0,1/4$ [0, \bar{v},w]	
	$0,\bar{x},3/4$ [$\bar{v},0,w$]	$0,x,3/4$ [$v,0,w$]	
2 b $\bar{4}$..	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0,w]	
1 a $22'2'$.	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0,w]	

Symmetry of special projections

Along [001] $4'mm'$	Along [100] $p2'm'm$	Along [110] $p11m'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,1/4$	$a^* = c/2$ Origin at $x,x,0$

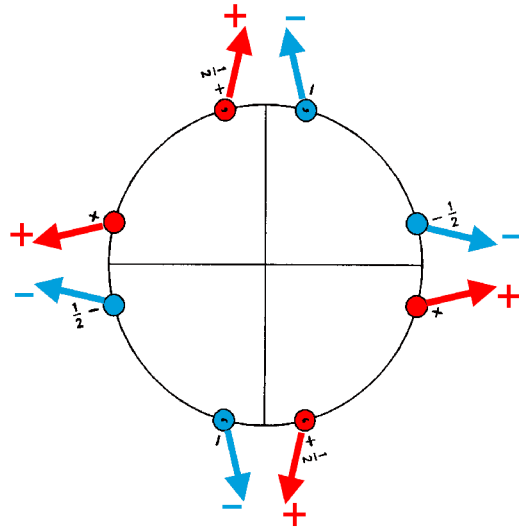
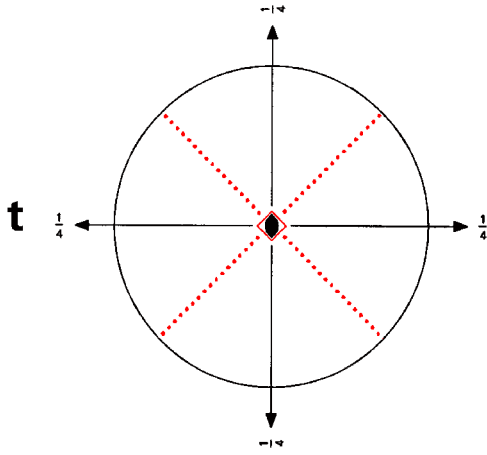
$p\bar{4}'2c'$

No. 38.4.198

$\bar{4}'2m'$

$p\bar{4}'2c'$

Tetragonal



Origin at $\bar{4}'1c'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--------------------------------------|--------------------------------------|--|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) $\bar{4}'^+$ $0,0,z; 0,0,0$
($\bar{4}'_z$ 0,0,0)' | (4) $\bar{4}'^-$ $0,0,z; 0,0,0$
($\bar{4}'_z^{-1}$ 0,0,0)' |
| (5) 2 $0,y,1/4$
(2_y 0,0,1/2) | (6) 2 $x,0,1/4$
(2_x 0,0,1/2) | (7) c' (0,0,1/2) x,\bar{x},z
(m_{xy} 0,0,1/2)' | (8) c' (0,0,1/2) x,x,z
($m_{\bar{xy}}$ 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1)	(2)	
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) y,\bar{x},\bar{z} [v, \bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]	
	(5) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	(6) $x,\bar{y},\bar{z}+1/2$ [u,\bar{v},\bar{w}]	
	(7) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(8) $y,x,z+1/2$ [v,u,w]	
	4 e 2..	0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]
		0,0, $\bar{z}+1/2$ [0,0, \bar{w}]	0,0,z+1/2 [0,0,w]
	4 d .2.	0,y,1/4 [0,v,0]	0, \bar{y} ,1/4 [0, \bar{v} ,0]
		y,0,3/4 [v,0,0]	\bar{y} ,0,3/4 [\bar{v} ,0,0]
4 c .2.	x,0,1/4 [u,0,0]	\bar{x} ,0,1/4 [\bar{u} ,0,0]	
	0, \bar{x} ,3/4 [0, \bar{u} ,0]	0,x,3/4 [0,u,0]	
2 b $\bar{4}'$..	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]	
1 a 222.	0,0,1/4 [0,0,0]	0,0,3/4 [0,0,0]	

Symmetry of special projections

Along [001] $4m'm'$	Along [100] $p2m'm'$	Along [110] $p11m'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,1/4	$a^* = c/2$ Origin at x,x,0

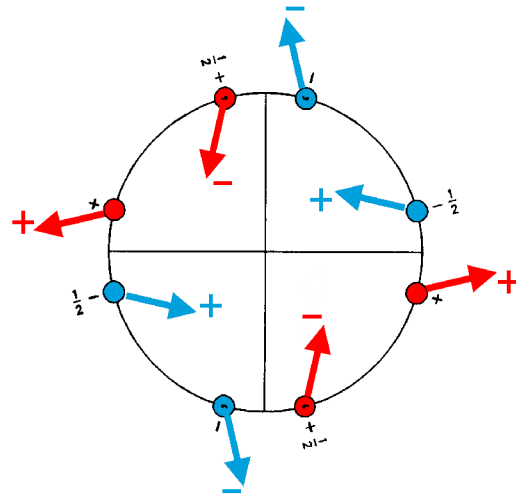
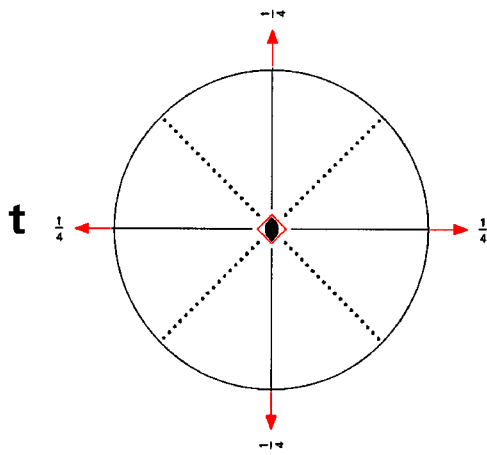
$p\bar{4}'2'c$

$\bar{4}'2'm$

Tetragonal

No. 38.5.199

$p\bar{4}'2'c$



Origin at $\bar{4}'1c$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) 2' $0,y,1/4$
(2 _y 0,0,1/2)' | (6) 2' $x,0,1/4$
(2 _x 0,0,1/2)' | (7) c (0,0,1/2) x,\bar{x},z
(m _{xy} 0,0,1/2) | (8) c (0,0,1/2) x,x,z
(m _{xy} 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) y,\bar{x},\bar{z} [v, \bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]	
	(5) $\bar{x},y,\bar{z}+1/2$ [u, \bar{v},w]	(6) $x,\bar{y},\bar{z}+1/2$ [\bar{u},v,w]	
	(7) $\bar{y},\bar{x},z+1/2$ [v,u, \bar{w}]	(8) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]	
	4 e 2..	0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]
		0,0, $\bar{z}+1/2$ [0,0,w]	0,0,z+1/2 [0,0, \bar{w}]
	4 d .2'.	0,y,1/4 [u,0,w]	0, \bar{y} ,1/4 [$\bar{u},0,w$]
		y,0,3/4 [0, \bar{u},\bar{w}]	\bar{y} ,0,3/4 [0,u, \bar{w}]
4 c .2'.	x,0,1/4 [0,v,w]	\bar{x} ,0,1/4 [0, \bar{v},w]	
	0, \bar{x} ,3/4 [v,0, \bar{w}]	0,x,3/4 [$\bar{v},0,\bar{w}$]	
2 b $\bar{4}'$..	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]	
1 a 22'2'.	0,0,1/4 [0,0,w]	0,0,3/4 [0,0, \bar{w}]	

Symmetry of special projections

Along [001] 4mm	Along [100] $\rho 2'mm'$ $a^* = c$	Along [110] $\rho_{2a^*} 11m'$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,1/4	Origin at x,x,0

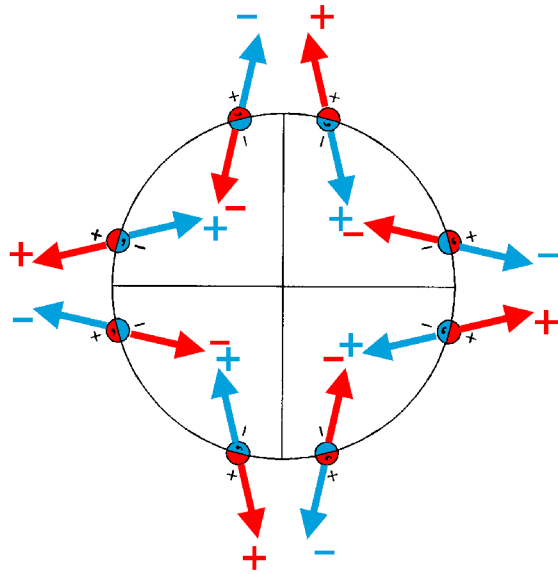
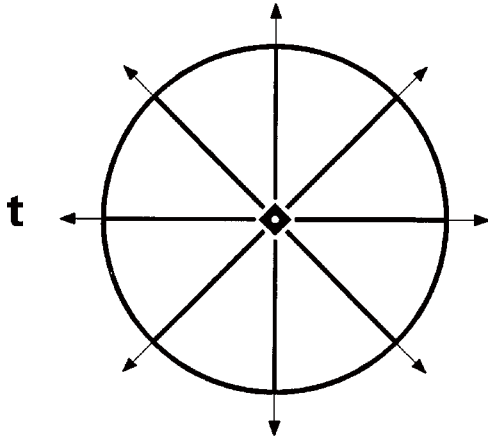
$p4/mmm$

$4/mmm$

Tetragonal

No. 39.1.200

$p4/m2/m2/m$



Origin at center ($4/mmm$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; x \leq y$

Symmetry operations

- | | | | |
|--|---|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x, \bar{x} ,0
(2 _{\bar{xy}} 0,0,0) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z ⁺ 0,0,0) | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻¹ 0,0,0) |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m x, \bar{x} ,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{\bar{xy}} 0,0,0) |

Generators selected (1); t(0,0,1); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y, \bar{z} [\bar{u},\bar{v},w]	(11) y, \bar{x},\bar{z} [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v, \bar{u},w]
	(13) x, \bar{y},z [\bar{u},v,\bar{w}]	(14) \bar{x},y,z [u, \bar{v},\bar{w}]	(15) \bar{y},\bar{x},z [v,u, \bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]
8 k .m.	x,0,z [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	0,x,z [$\bar{v},0,0$]	0, \bar{x},z [v,0,0]
	$\bar{x},0,\bar{z}$ [0,v,0]	x,0, \bar{z} [0, $\bar{v},0$]	0,x, \bar{z} [v,0,0]	0, \bar{x},\bar{z} [$\bar{v},0,0$]
8 j ..m	x,x,z [u, $\bar{u},0$]	\bar{x},\bar{x},z [$\bar{u},u,0$]	\bar{x},x,z [u,u,0]	x, \bar{x},z [$\bar{u},\bar{u},0$]
	\bar{x},x,\bar{z} [$\bar{u},\bar{u},0$]	x, \bar{x},\bar{z} [u,u,0]	x,x, \bar{z} [$\bar{u},u,0$]	\bar{x},\bar{x},\bar{z} [u, $\bar{u},0$]
8 i m..	x,y,1/2 [0,0,w]	$\bar{x},\bar{y},1/2$ [0,0,w]	$\bar{y},x,1/2$ [0,0,w]	y, $\bar{x},1/2$ [0,0,w]
	$\bar{x},y,1/2$ [0,0, \bar{w}]	x, $\bar{y},1/2$ [0,0, \bar{w}]	y,x,1/2 [0,0, \bar{w}]	$\bar{y},\bar{x},1/2$ [0,0, \bar{w}]
8 h m..	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0,w]	y, $\bar{x},0$ [0,0,w]
	$\bar{x},y,0$ [0,0, \bar{w}]	x, $\bar{y},0$ [0,0, \bar{w}]	y,x,0 [0,0, \bar{w}]	$\bar{y},\bar{x},0$ [0,0, \bar{w}]
4 g m2m.	x,0,1/2 [0,0,0]	$\bar{x},0,1/2$ [0,0,0]	0,x,1/2 [0,0,0]	0, $\bar{x},1/2$ [0,0,0]
4 f m2m.	x,0,0 [0,0,0]	$\bar{x},0,0$ [0,0,0]	0,x,0 [0,0,0]	0, $\bar{x},0$ [0,0,0]
4 e m.2m	x,x,1/2 [0,0,0]	$\bar{x},\bar{x},1/2$ [0,0,0]	$\bar{x},x,1/2$ [0,0,0]	x, $\bar{x},1/2$ [0,0,0]
4 d m.2m	x,x,0 [0,0,0]	$\bar{x},\bar{x},0$ [0,0,0]	$\bar{x},x,0$ [0,0,0]	x, $\bar{x},0$ [0,0,0]

Continued

No. 39.1.200

$p4/mmm$

2 c $4mm$ $0,0,z$ $[0,0,0]$ $0,0,\bar{z}$ $[0,0,0]$

1 b $4/mmm$ $0,0,1/2$ $[0,0,0]$

1 a $4/mmm$ $0,0,0$ $[0,0,0]$

Symmetry of special projections

Along $[001]$ $4mm1'$	Along $[100]$ $p2mm1'$	Along $[110]$ $p2mm1'$
	$a^* = c$	$a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

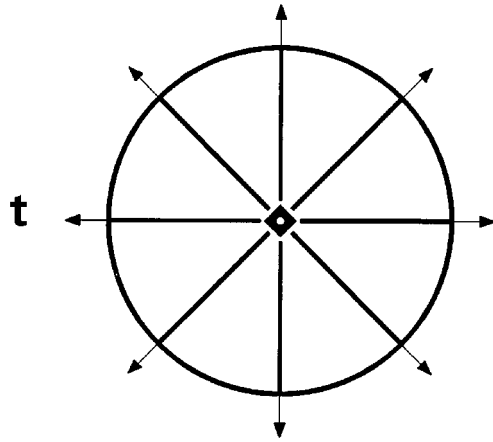
$p4/mmm1'$

$4/mmm1'$

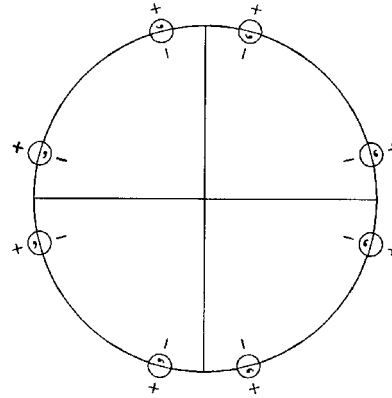
Tetragonal

No. 39.2.201

$p4/m2/m2/m1'$



1'



Origin at center ($4/mmm1'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; x \leq y$

Symmetry operations

For $1 +$ set

- | | | | |
|--|-------------------------------------|--|---|
| (1) 1
($1 0,0,0$) | (2) 2 $0,0,z$
($2_z 0,0,0$) | (3) 4^+ $0,0,z$
($4_z 0,0,0$) | (4) 4^- $0,0,z$
($4_z^{-1} 0,0,0$) |
| (5) 2 $0,y,0$
($2_y 0,0,0$) | (6) 2 $x,0,0$
($2_x 0,0,0$) | (7) 2 $x,x,0$
($2_{xy} 0,0,0$) | (8) 2 $x,\bar{x},0$
($2_{\bar{xy}} 0,0,0$) |
| (9) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (10) m $x,y,0$
($m_z 0,0,0$) | (11) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z 0,0,0$) | (12) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1} 0,0,0$) |
| (13) m $x,0,z$
($m_y 0,0,0$) | (14) m $0,y,z$
($m_x 0,0,0$) | (15) m x,\bar{x},z
($m_{xy} 0,0,0$) | (16) m x,x,z
($m_{\bar{xy}} 0,0,0$) |

For $1' +$ set

- | | | | |
|--|---------------------------------------|--|---|
| (1) $1'$
($1 0,0,0$)' | (2) $2'$ $0,0,z$
($2_z 0,0,0$)' | (3) $4^{+'}$ $0,0,z$
($4_z 0,0,0$)' | (4) $4^{-'}$ $0,0,z$
($4_z^{-1} 0,0,0$)' |
| (5) $2'$ $0,y,0$
($2_y 0,0,0$)' | (6) $2'$ $x,0,0$
($2_x 0,0,0$)' | (7) $2'$ $x,x,0$
($2_{xy} 0,0,0$)' | (8) $2'$ $x,\bar{x},0$
($2_{\bar{xy}} 0,0,0$)' |
| (9) $\bar{1}'$ $0,0,0$
($\bar{1} 0,0,0$)' | (10) m' $x,y,0$
($m_z 0,0,0$)' | (11) $\bar{4}^{+'}$ $0,0,z; 0,0,0$
($\bar{4}_z 0,0,0$)' | (12) $\bar{4}^{-'}$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1} 0,0,0$)' |
| (13) m' $x,0,z$
($m_y 0,0,0$)' | (14) m' $0,y,z$
($m_x 0,0,0$)' | (15) m' x,\bar{x},z
($m_{xy} 0,0,0$)' | (16) m' x,x,z
($m_{\bar{xy}} 0,0,0$)' |

Generators selected (1); t(0,0,1); (2); (3); (5); (9); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1'+		
16 l 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]	(3) \bar{y},x,z [0,0,0]	(4) y, \bar{x},z [0,0,0]
	(5) \bar{x},y,\bar{z} [0,0,0]	(6) x, \bar{y},\bar{z} [0,0,0]	(7) y,x, \bar{z} [0,0,0]	(8) \bar{y},\bar{x},\bar{z} [0,0,0]
	(9) \bar{x},\bar{y},\bar{z} [0,0,0]	(10) x,y, \bar{z} [0,0,0]	(11) y, \bar{x},\bar{z} [0,0,0]	(12) \bar{y},x,\bar{z} [0,0,0]
	(13) x, \bar{y},z [0,0,0]	(14) \bar{x},y,z [0,0,0]	(15) \bar{y},\bar{x},z [0,0,0]	(16) y,x,z [0,0,0]
8 k .m.1'	x,0,z [0,0,0]	$\bar{x},0,z$ [0,0,0]	0,x,z [0,0,0]	0, \bar{x},z [0,0,0]
	$\bar{x},0,\bar{z}$ [0,0,0]	x,0, \bar{z} [0,0,0]	0,x, \bar{z} [0,0,0]	0, \bar{x},\bar{z} [0,0,0]
8 j ..m1'	x,x,z [0,0,0]	\bar{x},\bar{x},z [0,0,0]	\bar{x},x,z [0,0,0]	x, \bar{x},z [0,0,0]
	\bar{x},x,\bar{z} [0,0,0]	x, \bar{x},\bar{z} [0,0,0]	x,x, \bar{z} [0,0,0]	\bar{x},\bar{x},\bar{z} [0,0,0]
8 i m..1'	x,y,1/2 [0,0,0]	$\bar{x},\bar{y},1/2$ [0,0,0]	$\bar{y},x,1/2$ [0,0,0]	y, $\bar{x},1/2$ [0,0,0]
	$\bar{x},y,1/2$ [0,0,0]	x, $\bar{y},1/2$ [0,0,0]	y,x,1/2 [0,0,0]	$\bar{y},\bar{x},1/2$ [0,0,0]
8 h m..1'	x,y,0 [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]	$\bar{y},x,0$ [0,0,0]	y, $\bar{x},0$ [0,0,0]
	$\bar{x},y,0$ [0,0,0]	x, $\bar{y},0$ [0,0,0]	y,x,0 [0,0,0]	$\bar{y},\bar{x},0$ [0,0,0]
4 g m2m.1'	x,0,1/2 [0,0,0]	$\bar{x},0,1/2$ [0,0,0]	0,x,1/2 [0,0,0]	0, $\bar{x},1/2$ [0,0,0]
4 f m2m.1'	x,0,0 [0,0,0]	$\bar{x},0,0$ [0,0,0]	0,x,0 [0,0,0]	0, $\bar{x},0$ [0,0,0]
4 e m.2m1'	x,x,1/2 [0,0,0]	$\bar{x},\bar{x},1/2$ [0,0,0]	$\bar{x},x,1/2$ [0,0,0]	x, $\bar{x},1/2$ [0,0,0]
4 d m.2m1'	x,x,0 [0,0,0]	$\bar{x},\bar{x},0$ [0,0,0]	$\bar{x},x,0$ [0,0,0]	x, $\bar{x},0$ [0,0,0]

Continued

No. 39.2.201

$p4/mmm1'$

2 c $4mm1'$ $0,0,z [0,0,0]$ $0,0,\bar{z} [0,0,0]$

1 b $4/mmm1'$ $0,0,1/2 [0,0,0]$

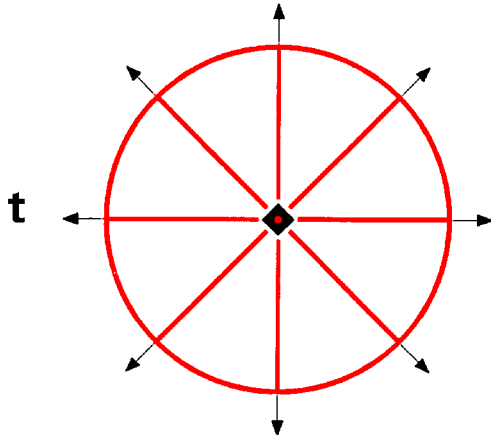
1 a $4/mmm1'$ $0,0,0 [0,0,0]$

Symmetry of special projections

Along $[001]$ $4mm1'$	Along $[100]$ $p2mm1'$	Along $[110]$ $p2mm1'$
	$a^* = c$	$a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

$p4/m'm'm'$

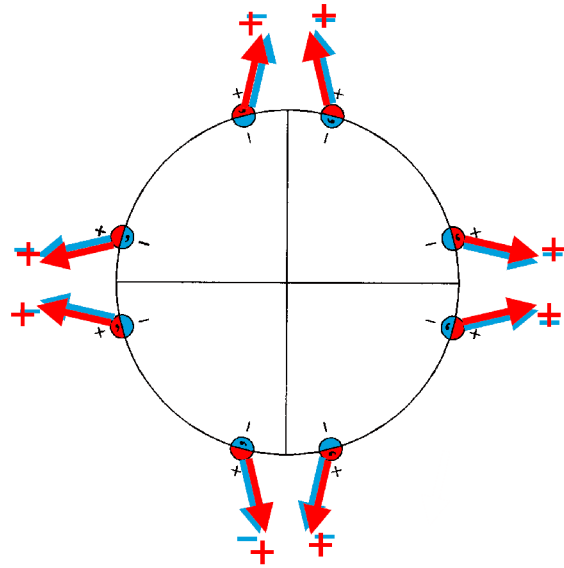
No. 39.3.202



$4/m'm'm'$

$p4/m'2/m'2/m'$

Tetragonal



Origin at center ($4/m'm'm'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; x \leq y$

Symmetry operations

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,̄x,0
(2 _{̄xy} 0,0,0) |
| (9) ̄1 0,0,0
(̄1 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) ̄4 ⁺ 0,0,z; 0,0,0
(̄4 _z 0,0,0)' | (12) ̄4 ⁻ 0,0,z; 0,0,0
(̄4 _z ⁻¹ 0,0,0)' |
| (13) m' x,0,z
(m _y 0,0,0)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) m' x,̄x,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{̄xy} 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y, \bar{z} [u,v, \bar{w}]	(11) y, \bar{x},\bar{z} [v, \bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(13) x, \bar{y},z [u, \bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]
8 k .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	0,x,z [0,u,w]	0, \bar{x},z [0, \bar{u},w]
	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,0, \bar{z} [u,0, \bar{w}]	0,x, \bar{z} [0,u, \bar{w}]	0, \bar{x},\bar{z} [0, \bar{u},\bar{w}]
8 j ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [\bar{u},u,w]	x, \bar{x},z [u, \bar{u},w]
	\bar{x},x,\bar{z} [\bar{u},u,\bar{w}]	x, \bar{x},\bar{z} [u, \bar{u},\bar{w}]	x,x, \bar{z} [u,u, \bar{w}]	\bar{x},\bar{x},\bar{z} [\bar{u},\bar{u},\bar{w}]
8 i m'..	x,y,1/2 [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]	$\bar{y},x,1/2$ [$\bar{v},u,0$]	y, $\bar{x},1/2$ [v, $\bar{u},0$]
	$\bar{x},y,1/2$ [$\bar{u},v,0$]	x, $\bar{y},1/2$ [u, $\bar{v},0$]	y,x,1/2 [v,u,0]	$\bar{y},\bar{x},1/2$ [$\bar{v},\bar{u},0$]
8 h m'..	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [$\bar{v},u,0$]	y, $\bar{x},0$ [v, $\bar{u},0$]
	$\bar{x},y,0$ [$\bar{u},v,0$]	x, $\bar{y},0$ [u, $\bar{v},0$]	y,x,0 [v,u,0]	$\bar{y},\bar{x},0$ [$\bar{v},\bar{u},0$]
4 g m'2m'	x,0,1/2 [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]	0,x,1/2 [0,u,0]	0, $\bar{x},1/2$ [0, $\bar{u},0$]
4 f m'2m'	x,0,0 [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]	0,x,0 [0,u,0]	0, $\bar{x},0$ [0, $\bar{u},0$]
4 e m'.2m'	x,x,1/2 [u,u,0]	$\bar{x},\bar{x},1/2$ [$\bar{u},\bar{u},0$]	$\bar{x},x,1/2$ [$\bar{u},u,0$]	x, $\bar{x},1/2$ [u, $\bar{u},0$]
4 d m'.2m'	x,x,0 [u,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	$\bar{x},x,0$ [$\bar{u},u,0$]	x, $\bar{x},0$ [u, $\bar{u},0$]

Continued

No. 39.3.202

$p4/m'm'm'$

2 c $4m'm'$ $0,0,z [0,0,w]$ $0,0,\bar{z} [0,0,\bar{w}]$

1 b $4/m'm'm'$ $0,0,1/2 [0,0,0]$

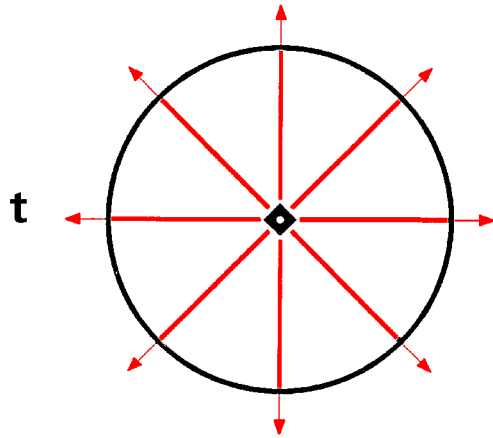
1 a $4/m'm'm'$ $0,0,0 [0,0,0]$

Symmetry of special projections

Along $[001]$ $4m'm'$	Along $[100]$ $p2m'm'$	Along $[110]$ $p2m'm'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

$p4/mm'm'$

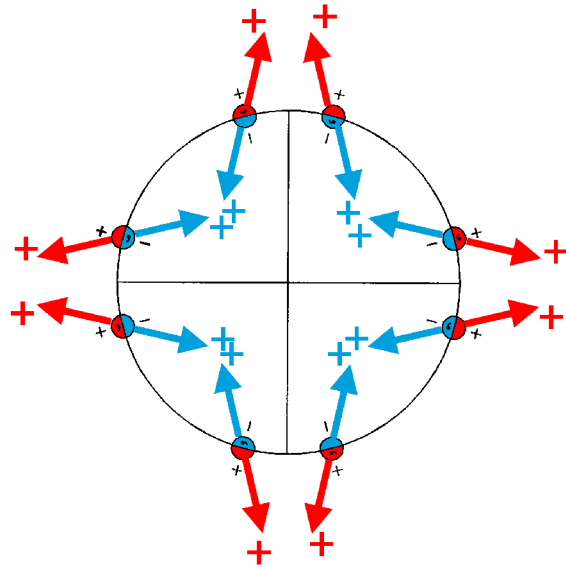
No. 39.4.203



$4/mm'm'$

$p4/m2'/m2'/m'$

Tetragonal



Origin at center ($4/mm'm'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $x \leq y$

Symmetry operations

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x, \bar{x} ,0
(2 _{\bar{y}} 0,0,0)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z 0,0,0) | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻¹ 0,0,0) |
| (13) m' x,0,z
(m _y 0,0,0)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) m' x, \bar{x} ,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{\bar{y}} 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]
	(5) \bar{x},y,\bar{z} [\bar{u},\bar{v},w]	(6) x, \bar{y},\bar{z} [\bar{u},v,w]	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y, \bar{z} [\bar{u},\bar{v},w]	(11) y, \bar{x},\bar{z} [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v, \bar{u},w]
	(13) x, \bar{y},z [u, \bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]
8 k .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	0,x,z [0,u,w]	0, \bar{x},z [0, \bar{u},w]
	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [$\bar{u},0,w$]	0,x, \bar{z} [0, \bar{u},w]	0, \bar{x},\bar{z} [0,u,w]
8 j ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [\bar{u},u,w]	x, \bar{x},z [u, \bar{u},w]
	\bar{x},x,\bar{z} [u, \bar{u},w]	x, \bar{x},\bar{z} [\bar{u},u,w]	x,x, \bar{z} [\bar{u},\bar{u},w]	\bar{x},\bar{x},\bar{z} [u,u,w]
8 i m..	x,y,1/2 [0,0,w]	$\bar{x},\bar{y},1/2$ [0,0,w]	$\bar{y},x,1/2$ [0,0,w]	y, $\bar{x},1/2$ [0,0,w]
	$\bar{x},y,1/2$ [0,0,w]	x, $\bar{y},1/2$ [0,0,w]	y,x,1/2 [0,0,w]	$\bar{y},\bar{x},1/2$ [0,0,w]
8 h m..	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0,w]	y, $\bar{x},0$ [0,0,w]
	$\bar{x},y,0$ [0,0,w]	x, $\bar{y},0$ [0,0,w]	y,x,0 [0,0,w]	$\bar{y},\bar{x},0$ [0,0,w]
4 g m2'm'	x,0,1/2 [0,0,w]	$\bar{x},0,1/2$ [0,0,w]	0,x,1/2 [0,0,w]	0, $\bar{x},1/2$ [0,0,w]
4 f m2'm'	x,0,0 [0,0,w]	$\bar{x},0,0$ [0,0,w]	0,x,0 [0,0,w]	0, $\bar{x},0$ [0,0,w]
4 e m.2'm'	x,x,1/2 [0,0,w]	$\bar{x},\bar{x},1/2$ [0,0,w]	$\bar{x},x,1/2$ [0,0,w]	x, $\bar{x},1/2$ [0,0,w]
4 d m.2'm'	x,x,0 [0,0,w]	$\bar{x},\bar{x},0$ [0,0,w]	$\bar{x},x,0$ [0,0,w]	x, $\bar{x},0$ [0,0,w]

Continued

No. 39.4.203

$p4/mm'm'$

2 c $4m'm'$ $0,0,z [0,0,w]$ $0,0,\bar{z} [0,0,w]$

1 b $4/mm'm'$ $0,0,1/2 [0,0,w]$

1 a $4/mm'm'$ $0,0,0 [0,0,w]$

Symmetry of special projections

Along $[001]$ $4mm1'$	Along $[100]$ $p2'mm'$ $a^* = c$	Along $[110]$ $p2'mm'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

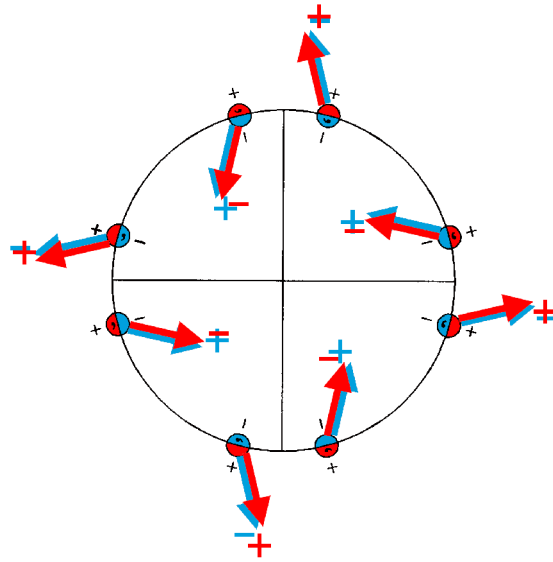
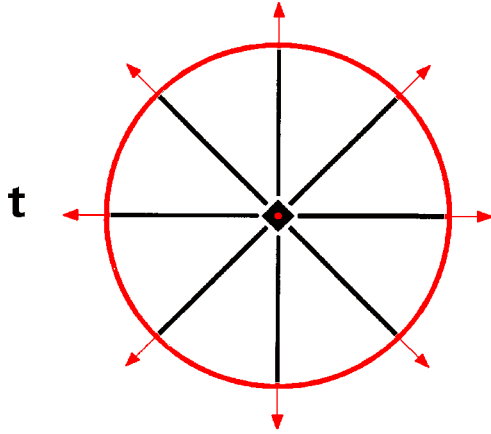
$p4/m'mm$

No. 39.5.204

$4/m'mm$

$p4/m'2'/m2'/m$

Tetragonal



Origin at center ($4/m'mm$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; x \leq y$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' _y 0,y,0
(2 _y 0,0,0)' | (6) 2' _x x,0,0
(2 _x 0,0,0)' | (7) 2' _{xy} x,x,0
(2 _{xy} 0,0,0)' | (8) 2' _{xy} x,̄x,0
(2 _{xy} 0,0,0)' |
| (9) ̄1 0,0,0
(̄1 0,0,0)' | (10) m' _z x,y,0
(m _z 0,0,0)' | (11) ̄4 ⁺ 0,0,z; 0,0,0
(̄4 _z 0,0,0)' | (12) ̄4 ⁻ 0,0,z; 0,0,0
(̄4 _z ⁻¹ 0,0,0)' |
| (13) m _y x,0,z
(m _y 0,0,0) | (14) m _x 0,y,z
(m _x 0,0,0) | (15) m _{xy} x,̄x,z
(m _{xy} 0,0,0) | (16) m _{xy} x,x,z
(m _{xy} 0,0,0) |

Generators selected (1); t(0,0,1); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]
	(5) \bar{x},y,\bar{z} [\bar{u},\bar{v},w]	(6) x, \bar{y},\bar{z} [\bar{u},v,w]	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y, \bar{z} [u,v, \bar{w}]	(11) y, \bar{x},\bar{z} [v, \bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(13) x, \bar{y},z [\bar{u},v,\bar{w}]	(14) \bar{x},y,z [u, \bar{v},\bar{w}]	(15) \bar{y},\bar{x},z [v,u, \bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]
8 k .m.	x,0,z [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	0,x,z [$\bar{v},0,0$]	0, \bar{x},z [v,0,0]
	$\bar{x},0,\bar{z}$ [0, $\bar{v},0$]	x,0, \bar{z} [0,v,0]	0,x, \bar{z} [$\bar{v},0,0$]	0, \bar{x},\bar{z} [v,0,0]
8 j ..m	x,x,z [u, $\bar{u},0$]	\bar{x},\bar{x},z [$\bar{u},u,0$]	\bar{x},x,z [u,u,0]	x, \bar{x},z [$\bar{u},\bar{u},0$]
	\bar{x},x,\bar{z} [u,u,0]	x, \bar{x},\bar{z} [$\bar{u},\bar{u},0$]	x,x, \bar{z} [u, $\bar{u},0$]	\bar{x},\bar{x},\bar{z} [$\bar{u},u,0$]
8 i m'..	x,y,1/2 [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]	$\bar{y},x,1/2$ [$\bar{v},u,0$]	y, $\bar{x},1/2$ [v, $\bar{u},0$]
	$\bar{x},y,1/2$ [u, $\bar{v},0$]	x, $\bar{y},1/2$ [$\bar{u},v,0$]	y,x,1/2 [$\bar{v},\bar{u},0$]	$\bar{y},\bar{x},1/2$ [v,u,0]
8 h m'..	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [$\bar{v},u,0$]	y, $\bar{x},0$ [v, $\bar{u},0$]
	$\bar{x},y,0$ [u, $\bar{v},0$]	x, $\bar{y},0$ [$\bar{u},v,0$]	y,x,0 [$\bar{v},\bar{u},0$]	$\bar{y},\bar{x},0$ [v,u,0]
4 g m'2'm.	x,0,1/2 [0,v,0]	$\bar{x},0,1/2$ [0, $\bar{v},0$]	0,x,1/2 [$\bar{v},0,0$]	0, $\bar{x},1/2$ [v,0,0]
4 f m'2'm.	x,0,0 [0,v,0]	$\bar{x},0,0$ [0, $\bar{v},0$]	0,x,0 [$\bar{v},0,0$]	0, $\bar{x},0$ [v,0,0]
4 e m'.2'm	x,x,1/2 [u, $\bar{u},0$]	$\bar{x},\bar{x},1/2$ [$\bar{u},u,0$]	$\bar{x},x,1/2$ [u,u,0]	x, $\bar{x},1/2$ [$\bar{u},\bar{u},0$]
4 d m'.2'm	x,x,0 [u, $\bar{u},0$]	$\bar{x},\bar{x},0$ [$\bar{u},u,0$]	$\bar{x},x,0$ [u,u,0]	x, $\bar{x},0$ [$\bar{u},\bar{u},0$]

Continued

No. 39.5.204

$p4/m'mm$

2 c 4mm $0,0,z [0,0,0]$ $0,0,\bar{z} [0,0,0]$

1 b $4/m'mm$ $0,0,1/2 [0,0,0]$

1 a $4/m'mm$ $0,0,0 [0,0,0]$

Symmetry of special projections

Along $[001]$ 4mm	Along $[100]$ $p2mm1'$	Along $[110]$ $p2mm1'$
	$a^* = c$	$a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

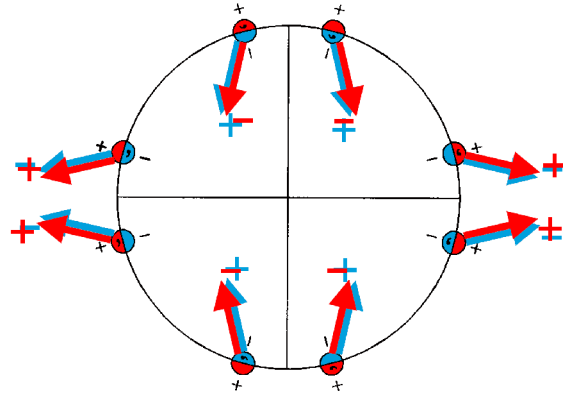
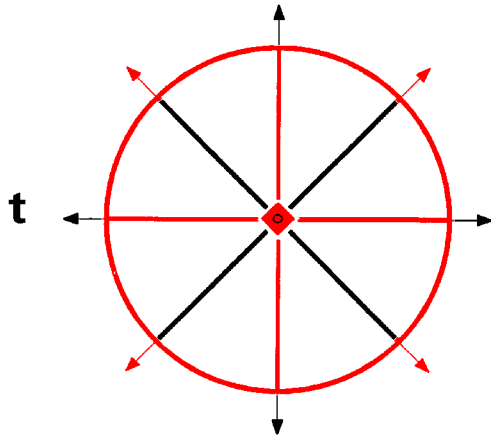
$p4'/m'm'm$

$4'/m'm'm$

Tetragonal

No. 39.6.205

$p4'/m'2'/m'2'/m$



Origin at center ($4'/m'm'm$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; x \leq y$

Symmetry operations

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,x̄,0
(2 _{xy} 0,0,0)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z 0,0,0) | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻¹ 0,0,0) |
| (13) m' x,0,z
(m _y 0,0,0)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) m x,x̄,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{xy} 0,0,0) |

Generators selected (1); t(0,0,1); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x, \bar{y},\bar{z} [u,\bar{v},\bar{w}]	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y, \bar{z} [u,v,\bar{w}]	(11) y, \bar{x},\bar{z} [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v,\bar{u},w]
	(13) x, \bar{y},z [u,\bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) \bar{y},\bar{x},z [v,u,\bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]
8 k .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	0,x,z [0, \bar{u},\bar{w}]	0, \bar{x},z [0,u, \bar{w}]
	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,0, \bar{z} [u,0, \bar{w}]	0,x, \bar{z} [0, \bar{u},w]	0, \bar{x},\bar{z} [0,u,w]
8 j ..m	x,x,z [u, $\bar{u},0$]	\bar{x},\bar{x},z [$\bar{u},u,0$]	\bar{x},x,z [$\bar{u},\bar{u},0$]	x, \bar{x},z [u,u,0]
	\bar{x},x,\bar{z} [$\bar{u},\bar{u},0$]	x, \bar{x},\bar{z} [u,u,0]	x,x, \bar{z} [u, $\bar{u},0$]	\bar{x},\bar{x},\bar{z} [$\bar{u},u,0$]
8 i m'..	x,y,1/2 [u,v,0]	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]	$\bar{y},x,1/2$ [$v,\bar{u},0$]	y, $\bar{x},1/2$ [$\bar{v},u,0$]
	$\bar{x},y,1/2$ [$\bar{u},v,0$]	x, $\bar{y},1/2$ [$u,\bar{v},0$]	y,x,1/2 [$\bar{v},\bar{u},0$]	$\bar{y},\bar{x},1/2$ [$v,u,0$]
8 h m'..	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [$v,\bar{u},0$]	y, $\bar{x},0$ [$\bar{v},u,0$]
	$\bar{x},y,0$ [$\bar{u},v,0$]	x, $\bar{y},0$ [$u,\bar{v},0$]	y,x,0 [$\bar{v},\bar{u},0$]	$\bar{y},\bar{x},0$ [$v,u,0$]
4 g m'2m'	x,0,1/2 [u,0,0]	$\bar{x},0,1/2$ [$\bar{u},0,0$]	0,x,1/2 [0, $\bar{u},0$]	0, $\bar{x},1/2$ [0,u,0]
4 f m'2m'	x,0,0 [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]	0,x,0 [0, $\bar{u},0$]	0, $\bar{x},0$ [0,u,0]
4 e m'.2'm	x,x,1/2 [u, $\bar{u},0$]	$\bar{x},\bar{x},1/2$ [$\bar{u},u,0$]	$\bar{x},x,1/2$ [$\bar{u},\bar{u},0$]	x, $\bar{x},1/2$ [u,u,0]
4 d m'.2'm	x,x,0 [u, $\bar{u},0$]	$\bar{x},\bar{x},0$ [$\bar{u},u,0$]	$\bar{x},x,0$ [$\bar{u},\bar{u},0$]	x, $\bar{x},0$ [u,u,0]

Continued

No. 39.6.205

$p4'/m'm'm$

2 c $4'm'm$ $0,0,z [0,0,0]$ $0,0,\bar{z} [0,0,0]$

1 b $4'/m'm'm$ $0,0,1/2 [0,0,0]$

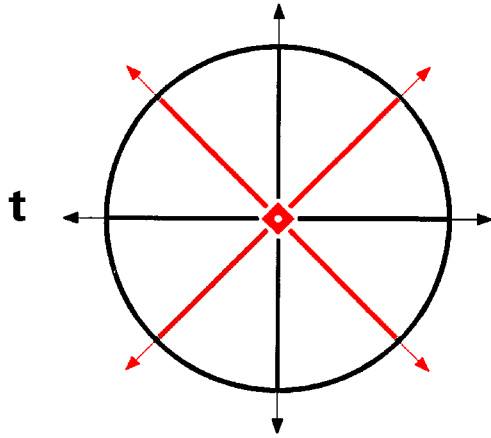
1 a $4'/m'm'm$ $0,0,0 [0,0,0]$

Symmetry of special projections

Along $[001]$ $4'm'm$	Along $[100]$ $p2m'm'$ $a^* = c$	Along $[110]$ $p2mm1'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

$p4'/mmm'$

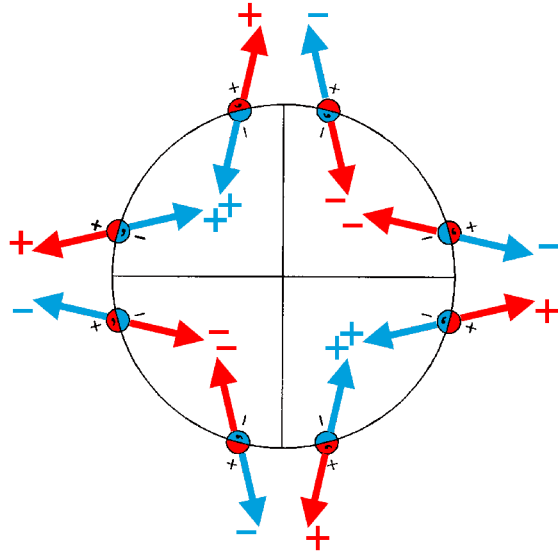
No. 39.7.206



$4'/mmm'$

$p4'/m2/m2'/m'$

Tetragonal



Origin at center ($4'/mmm'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $x \leq y$

Symmetry operations

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z ⁺ 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻ 0,0,0)' |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,̄x,0
(2 _{̄xy} 0,0,0)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z ⁺ 0,0,0)' | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻ 0,0,0)' |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m' x,̄x,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{̄xy} 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x, \bar{y},\bar{z} [u,\bar{v},\bar{w}]	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y, \bar{z} [\bar{u},\bar{v},w]	(11) y, \bar{x},\bar{z} [v,\bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(13) x, \bar{y},z [\bar{u},v,\bar{w}]	(14) \bar{x},y,z [u,\bar{v},\bar{w}]	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]
8 k .m.	x,0,z [0,v,0]	$\bar{x},0,z$ [0, \bar{v} ,0]	0,x,z [v,0,0]	0, \bar{x},z [\bar{v} ,0,0]
	$\bar{x},0,\bar{z}$ [0,v,0]	x,0, \bar{z} [0, \bar{v} ,0]	0,x, \bar{z} [\bar{v} ,0,0]	0, \bar{x},\bar{z} [v,0,0]
8 j ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [u, \bar{u},\bar{w}]	x, \bar{x},z [\bar{u},u,\bar{w}]
	\bar{x},x,\bar{z} [\bar{u},u,\bar{w}]	x, \bar{x},\bar{z} [u, \bar{u},\bar{w}]	x,x, \bar{z} [\bar{u},\bar{u},w]	\bar{x},\bar{x},\bar{z} [u,u,w]
8 i m..	x,y,1/2 [0,0,w]	$\bar{x},\bar{y},1/2$ [0,0,w]	$\bar{y},x,1/2$ [0,0, \bar{w}]	y, $\bar{x},1/2$ [0,0, \bar{w}]
	$\bar{x},y,1/2$ [0,0, \bar{w}]	x, $\bar{y},1/2$ [0,0, \bar{w}]	y,x,1/2 [0,0,w]	$\bar{y},\bar{x},1/2$ [0,0,w]
8 h m..	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0, \bar{w}]	y, $\bar{x},0$ [0,0, \bar{w}]
	$\bar{x},y,0$ [0,0, \bar{w}]	x, $\bar{y},0$ [0,0, \bar{w}]	y,x,0 [0,0,w]	$\bar{y},\bar{x},0$ [0,0,w]
4 g m2m.	x,0,1/2 [0,0,0]	$\bar{x},0,1/2$ [0,0,0]	0,x,1/2 [0,0,0]	0, $\bar{x},1/2$ [0,0,0]
4 f m2m.	x,0,0 [0,0,0]	$\bar{x},0,0$ [0,0,0]	0,x,0 [0,0,0]	0, $\bar{x},0$ [0,0,0]
4 e m.2'm'	x,x,1/2 [0,0,w]	$\bar{x},\bar{x},1/2$ [0,0,w]	$\bar{x},x,1/2$ [0,0, \bar{w}]	x, $\bar{x},1/2$ [0,0, \bar{w}]
4 d m.2'm'	x,x,0 [0,0,w]	$\bar{x},\bar{x},0$ [0,0,w]	$\bar{x},x,0$ [0,0, \bar{w}]	x, $\bar{x},0$ [0,0, \bar{w}]

Continued

No. 39.7.206

$p4'/mmm'$

2 c $4'mm'$ $0,0,z [0,0,0]$ $0,0,\bar{z} [0,0,0]$

1 b $4'/mmm'$ $0,0,1/2 [0,0,0]$

1 a $4'/mmm'$ $0,0,0 [0,0,0]$

Symmetry of special projections

Along $[001]$ $4mm1'$	Along $[100]$ $p2mm1'$	Along $[110]$ $p2'mm'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

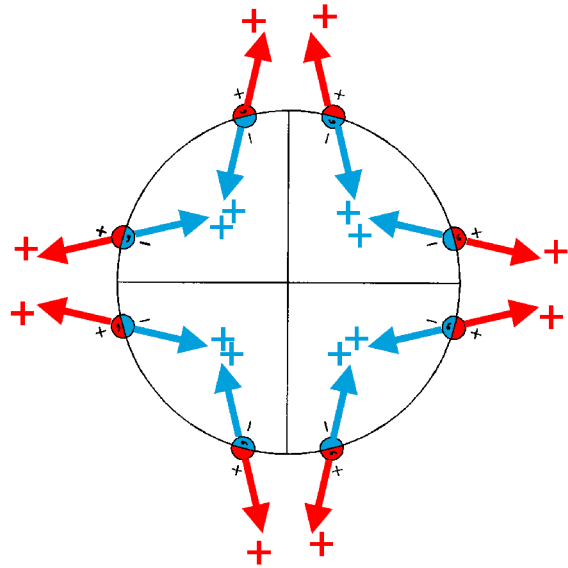
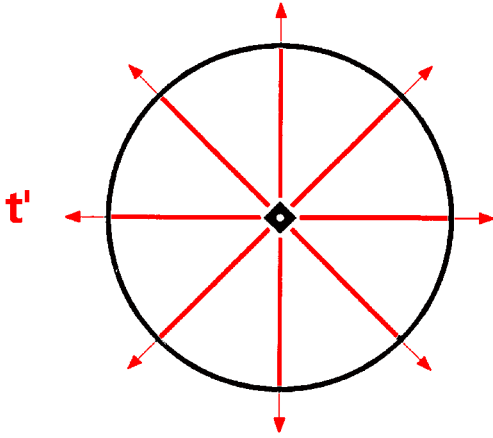
$p_{2c}4/mm'm'$

$4/mmm1'$

Tetragonal

No. 39.8.207

$p_{2c}4/m2'/m2'/m'$



Origin at center ($4/mmm'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; x \leq y$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x, \bar{x} ,0
(2 _{xy} 0,0,0)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z 0,0,0) | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻¹ 0,0,0) |
| (13) m' x,0,z
(m _y 0,0,0)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) m' x, \bar{x} ,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{xy} 0,0,0)' |

For $(0,0,1)$ ' + set

- | | | | |
|---|--|---|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2' (0,0,1) 0,0,z
(2 _z 0,0,1)' | (3) 4 ⁺ ' (0,0,1) 0,0,z
(4 _z 0,0,1)' | (4) 4 ⁻ ' (0,0,1) 0,0,z
(4 _z ⁻¹ 0,0,1)' |
| (5) 2 0,y,1/2
(2 _y 0,0,1) | (6) 2 x,0,1/2
(2 _x 0,0,1) | (7) 2 x,x,1/2
(2 _{xy} 0,0,1) | (8) 2 x, \bar{x} ,1/2
(2 _{xy} 0,0,1) |
| (9) $\bar{1}$ ' 0,0,1/2
($\bar{1}$ 0,0,1)' | (10) m' x,y,1/2
(m _z 0,0,1)' | (11) $\bar{4}$ ⁺ ' 0,0,z; 0,0,1/2
($\bar{4}$ _z 0,0,1)' | (12) $\bar{4}$ ⁻ ' 0,0,z; 0,0,1/2
($\bar{4}$ _z ⁻¹ 0,0,1)' |
| (13) c (0,0,1) x,0,z
(m _y 0,0,1) | (14) c (0,0,1) 0,y,z
(m _x 0,0,1) | (15) c (0,0,1) x, \bar{x} ,z
(m _{xy} 0,0,1) | (16) c (0,0,1) x,x,z
(m _{xy} 0,0,1) |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(0,0,1)'	+
16 l 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z [\bar{v},u,w]$	(4) $y,\bar{x},z [v,\bar{u},w]$
	(5) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(6) $x,\bar{y},\bar{z} [\bar{u},v,w]$	(7) $y,x,\bar{z} [\bar{v},\bar{u},w]$	(8) $\bar{y},\bar{x},\bar{z} [v,u,w]$
	(9) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(10) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(11) $y,\bar{x},\bar{z} [\bar{v},u,w]$	(12) $\bar{y},x,\bar{z} [v,\bar{u},w]$
	(13) $x,\bar{y},z [u,\bar{v},w]$	(14) $\bar{x},y,z [\bar{u},v,w]$	(15) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(16) $y,x,z [v,u,w]$
8 k .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$	$0,x,z [0,u,w]$	$0,\bar{x},z [0,\bar{u},w]$
	$\bar{x},0,\bar{z} [u,0,w]$	$x,0,\bar{z} [\bar{u},0,w]$	$0,x,\bar{z} [0,\bar{u},w]$	$0,\bar{x},\bar{z} [0,u,w]$
8 j ..m'	$x,x,z [u,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$	$\bar{x},x,z [\bar{u},u,w]$	$x,\bar{x},z [u,\bar{u},w]$
	$\bar{x},x,\bar{z} [u,\bar{u},w]$	$x,\bar{x},\bar{z} [\bar{u},u,w]$	$x,x,\bar{z} [\bar{u},\bar{u},w]$	$\bar{x},\bar{x},\bar{z} [u,u,w]$
8 i m'..	$x,y,1/2 [u,v,0]$	$\bar{x},\bar{y},1/2 [\bar{u},\bar{v},0]$	$\bar{y},x,1/2 [\bar{v},u,0]$	$y,\bar{x},1/2 [v,\bar{u},0]$
	$\bar{x},y,1/2 [u,\bar{v},0]$	$x,\bar{y},1/2 [\bar{u},v,0]$	$y,x,1/2 [\bar{v},\bar{u},0]$	$\bar{y},\bar{x},1/2 [v,u,0]$
8 h m..	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{y},x,0 [0,0,w]$	$y,\bar{x},0 [0,0,w]$
	$\bar{x},y,0 [0,0,w]$	$x,\bar{y},0 [0,0,w]$	$y,x,0 [0,0,w]$	$\bar{y},\bar{x},0 [0,0,w]$
4 g m'2m'	$x,0,1/2 [u,0,0]$	$\bar{x},0,1/2 [\bar{u},0,0]$	$0,x,1/2 [0,u,0]$	$0,\bar{x},1/2 [0,\bar{u},0]$
4 f m2'm'	$x,0,0 [0,0,w]$	$\bar{x},0,0 [0,0,w]$	$0,x,0 [0,0,w]$	$0,\bar{x},0 [0,0,w]$
4 e m'.2m'	$x,x,1/2 [u,u,0]$	$\bar{x},\bar{x},1/2 [\bar{u},\bar{u},0]$	$\bar{x},x,1/2 [\bar{u},u,0]$	$x,\bar{x},1/2 [u,\bar{u},0]$
4 d m.2'm'	$x,x,0 [0,0,w]$	$\bar{x},\bar{x},0 [0,0,w]$	$\bar{x},x,0 [0,0,w]$	$x,\bar{x},0 [0,0,w]$

Continued

No. 39.8.207

p_{2c} 4/mm'm'

2 c 4m'm' 0,0,z [0,0,w] 0,0, \bar{z} [0,0,w]

1 b 4/m'm'm' 0,0,1/2 [0,0,0]

1 a 4/mm'm' 0,0,0 [0,0,w]

Symmetry of special projections

Along [001] 4mm1'	Along [100] p_{2a^*} 2'mm'	Along [110] p_{2a^*} 2'mm'
	$a^* = c$	$a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

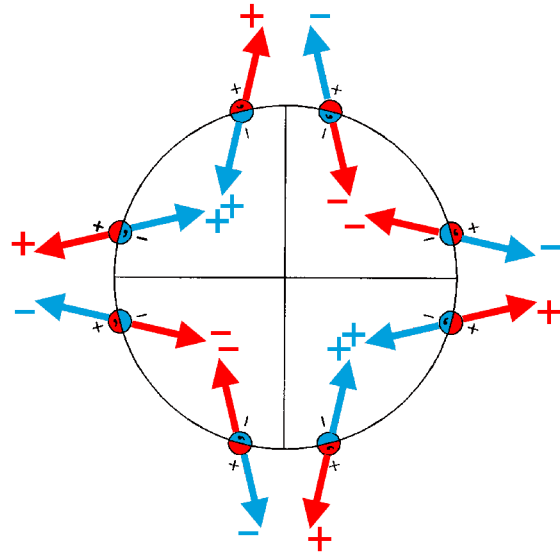
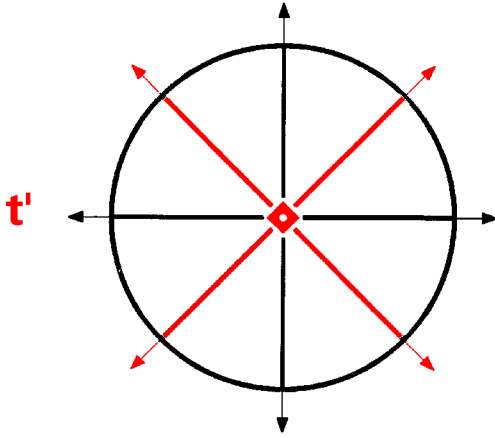
$p_{2c}4'/mmm'$

$4/mmm1'$

Tetragonal

No. 39.9.208

$p_{2c}4'/m2/m2'/m'$



Origin at center ($4'/mmm'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; x \leq y$

Symmetry operations

For (0,0,0) + set

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,x̄,0
(2 _{xy} 0,0,0)' |
| (9) 1̄ 0,0,0
(1̄ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) 4̄ ⁺ 0,0,z; 0,0,0
(4̄ _z 0,0,0)' | (12) 4̄ ⁻ 0,0,z; 0,0,0
(4̄ _z ⁻¹ 0,0,0)' |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m' x,x̄,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{xy} 0,0,0)' |

For (0,0,1)' + set

- | | | | |
|---|---|---|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2' (0,0,1) 0,0,z
(2 _z 0,0,1)' | (3) 4 ⁺ (0,0,1) 0,0,z
(4 _z 0,0,1) | (4) 4 ⁻ (0,0,1) 0,0,z
(4 _z ⁻¹ 0,0,1) |
| (5) 2' 0,y,1/2
(2 _y 0,0,1)' | (6) 2' x,0,1/2
(2 _x 0,0,1)' | (7) 2 x,x,1/2
(2 _{xy} 0,0,1) | (8) 2 x,x̄,1/2
(2 _{xy} 0,0,1) |
| (9) 1̄' 0,0,1/2
(1̄' 0,0,1)' | (10) m' x,y,1/2
(m _z 0,0,1)' | (11) 4̄ ⁺ 0,0,z; 0,0,1/2
(4̄ _z 0,0,1) | (12) 4̄ ⁻ 0,0,z; 0,0,1/2
(4̄ _z ⁻¹ 0,0,1) |
| (13) c' (0,0,1) x,0,z
(m _y 0,0,1)' | (14) c' (0,0,1) 0,y,z
(m _x 0,0,1)' | (15) c (0,0,1) x,x̄,z
(m _{xy} 0,0,1) | (16) c (0,0,1) x,x,z
(m _{xy} 0,0,1) |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(0,0,1)' +	
16 l 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z [v,\bar{u},\bar{w}]$	(4) $y,\bar{x},z [\bar{v},u,\bar{w}]$
	(5) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(6) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$	(7) $y,x,\bar{z} [\bar{v},\bar{u},w]$	(8) $\bar{y},\bar{x},\bar{z} [v,u,w]$
	(9) $\bar{x},\bar{y},z [u,v,w]$	(10) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(11) $y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]$	(12) $\bar{y},x,\bar{z} [\bar{v},u,\bar{w}]$
	(13) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(14) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(15) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(16) $y,x,z [v,u,w]$
8 k .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$	$0,x,z [v,0,0]$	$0,\bar{x},z [\bar{v},0,0]$
	$\bar{x},0,\bar{z} [0,v,0]$	$x,0,\bar{z} [0,\bar{v},0]$	$0,x,\bar{z} [\bar{v},0,0]$	$0,\bar{x},\bar{z} [v,0,0]$
8 j ..m'	$x,x,z [u,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$	$\bar{x},x,z [u,\bar{u},\bar{w}]$	$x,\bar{x},z [\bar{u},u,\bar{w}]$
	$\bar{x},x,\bar{z} [\bar{u},u,\bar{w}]$	$x,\bar{x},\bar{z} [u,\bar{u},\bar{w}]$	$x,x,\bar{z} [\bar{u},\bar{u},w]$	$\bar{x},\bar{x},\bar{z} [u,u,w]$
8 i m'..	$x,y,1/2 [u,v,0]$	$\bar{x},\bar{y},1/2 [\bar{u},\bar{v},0]$	$\bar{y},x,1/2 [v,\bar{u},0]$	$y,\bar{x},1/2 [\bar{v},u,0]$
	$\bar{x},y,1/2 [\bar{u},v,0]$	$x,\bar{y},1/2 [u,\bar{v},0]$	$y,x,1/2 [\bar{v},\bar{u},0]$	$\bar{y},\bar{x},1/2 [v,u,0]$
8 h m..	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{y},x,0 [0,0,\bar{w}]$	$y,\bar{x},0 [0,0,\bar{w}]$
	$\bar{x},y,0 [0,0,\bar{w}]$	$x,\bar{y},0 [0,0,\bar{w}]$	$y,x,0 [0,0,w]$	$\bar{y},\bar{x},0 [0,0,w]$
4 g m'2'm.	$x,0,1/2 [0,v,0]$	$\bar{x},0,1/2 [0,\bar{v},0]$	$0,x,1/2 [v,0,0]$	$0,\bar{x},1/2 [\bar{v},0,0]$
4 f m2m.	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$	$0,x,0 [0,0,0]$	$0,\bar{x},0 [0,0,0]$
4 e m'.2m'	$x,x,1/2 [u,u,0]$	$\bar{x},\bar{x},1/2 [\bar{u},\bar{u},0]$	$\bar{x},x,1/2 [u,\bar{u},0]$	$x,\bar{x},1/2 [\bar{u},u,0]$
4 d m.2'm'	$x,x,0 [0,0,w]$	$\bar{x},\bar{x},0 [0,0,w]$	$\bar{x},x,0 [0,0,\bar{w}]$	$x,\bar{x},0 [0,0,\bar{w}]$

Continued

No. 39.9.208

$p_{2c} 4'/mmm'$

2 c $4'mm'$ $0,0,z [0,0,0]$ $0,0,\bar{z} [0,0,0]$

1 b $4'/m'mm'$ $0,0,1/2 [0,0,0]$

1 a $4'/mmm'$ $0,0,0 [0,0,0]$

Symmetry of special projections

Along $[001] 4mm1'$	Along $[100] p2mm1'$	Along $[110] p_{2a^*} 2'mm'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x,0$

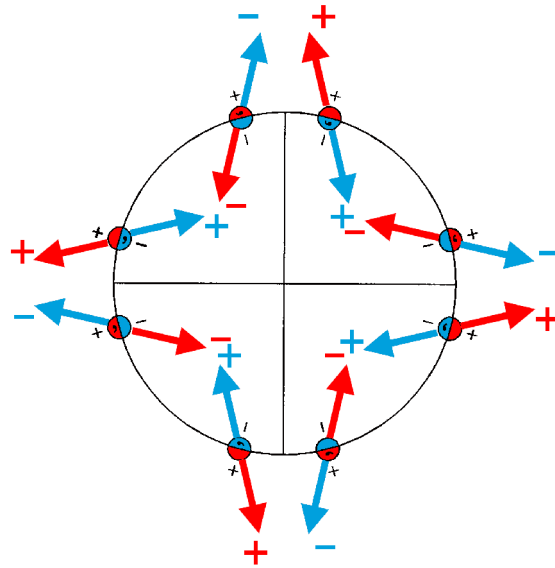
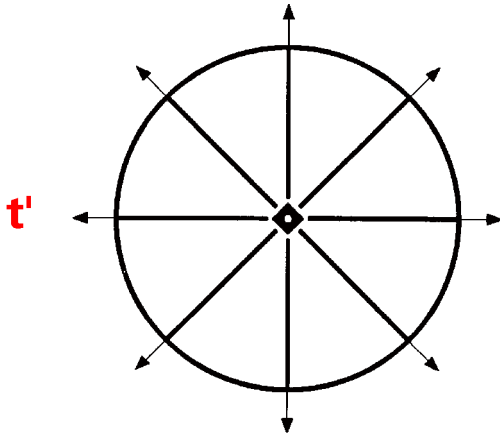
$p_{2c}4/mmm$

$4/mmm1'$

Tetragonal

No. 39.10.209

$p_{2c}4/m2/m2/m$



Origin at center ($4/mmm$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; x \leq y$

Symmetry operations

- | | | | |
|--|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,x̄,0
(2 _{xy} 0,0,0) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m x,x̄,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{xy} 0,0,0) |

For (0,0,1)' + set

- | | | | |
|---|---|--|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 2' (0,0,1) 0,0,z
(2 _z 0,0,1)' | (3) 4 ⁺ ' (0,0,1) 0,0,z
(4 _z 0,0,1)' | (4) 4 ⁻ ' (0,0,1) 0,0,z
(4 _z ⁻¹ 0,0,1)' |
| (5) 2' 0,y,1/2
(2 _y 0,0,1)' | (6) 2' x,0,1/2
(2 _x 0,0,1)' | (7) 2' x,x,1/2
(2 _{xy} 0,0,1)' | (8) 2' x,x̄,1/2
(2 _{xy} 0,0,1)' |
| (9) $\bar{1}$ ' 0,0,1/2
($\bar{1}$ 0,0,1)' | (10) m' x,y,1/2
(m _z 0,0,1)' | (11) $\bar{4}^+$ ' 0,0,z; 0,0,1/2
($\bar{4}_z$ 0,0,1)' | (12) $\bar{4}^-$ ' 0,0,z; 0,0,1/2
($\bar{4}_z^{-1}$ 0,0,1)' |
| (13) c' (0,0,1) x,0,z
(m _y 0,0,1)' | (14) c' (0,0,1) 0,y,z
(m _x 0,0,1)' | (15) c' (0,0,1) x,x̄,z
(m _{xy} 0,0,1)' | (16) c' (0,0,1) x,x,z
(m _{xy} 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(0,0,1)'	+
16 l 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z [\bar{v},u,w]$	(4) $y,\bar{x},z [v,\bar{u},w]$
	(5) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(6) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$	(7) $y,x,\bar{z} [v,u,\bar{w}]$	(8) $\bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]$
	(9) $\bar{x},\bar{y},z [u,v,w]$	(10) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(11) $y,\bar{x},z [\bar{v},u,w]$	(12) $\bar{y},x,\bar{z} [v,\bar{u},w]$
	(13) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(14) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(15) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(16) $y,x,z [v,\bar{u},\bar{w}]$
8 k .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$	$0,x,z [\bar{v},0,0]$	$0,\bar{x},z [v,0,0]$
	$\bar{x},0,\bar{z} [0,v,0]$	$x,0,\bar{z} [0,\bar{v},0]$	$0,x,\bar{z} [v,0,0]$	$0,\bar{x},\bar{z} [\bar{v},0,0]$
8 j ..m	$x,x,z [u,\bar{u},0]$	$\bar{x},\bar{x},z [\bar{u},u,0]$	$\bar{x},x,z [u,u,0]$	$x,\bar{x},z [\bar{u},\bar{u},0]$
	$\bar{x},x,\bar{z} [\bar{u},\bar{u},0]$	$x,\bar{x},\bar{z} [u,u,0]$	$x,x,\bar{z} [\bar{u},u,0]$	$\bar{x},\bar{x},\bar{z} [u,\bar{u},0]$
8 i m'..	$x,y,1/2 [u,v,0]$	$\bar{x},\bar{y},1/2 [\bar{u},\bar{v},0]$	$\bar{y},x,1/2 [\bar{v},u,0]$	$y,\bar{x},1/2 [v,\bar{u},0]$
	$\bar{x},y,1/2 [\bar{u},v,0]$	$x,\bar{y},1/2 [u,\bar{v},0]$	$y,x,1/2 [v,u,0]$	$\bar{y},\bar{x},1/2 [\bar{v},\bar{u},0]$
8 h m..	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{y},x,0 [0,0,w]$	$y,\bar{x},0 [0,0,w]$
	$\bar{x},y,0 [0,0,\bar{w}]$	$x,\bar{y},0 [0,0,\bar{w}]$	$y,x,0 [0,0,\bar{w}]$	$\bar{y},\bar{x},0 [0,0,\bar{w}]$
4 g m'2'm.	$x,0,1/2 [0,v,0]$	$\bar{x},0,1/2 [0,\bar{v},0]$	$0,x,1/2 [\bar{v},0,0]$	$0,\bar{x},1/2 [v,0,0]$
4 f m2m.	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$	$0,x,0 [0,0,0]$	$0,\bar{x},0 [0,0,0]$
4 e m'.2'm	$x,x,1/2 [u,\bar{u},0]$	$\bar{x},\bar{x},1/2 [\bar{u},u,0]$	$\bar{x},x,1/2 [u,u,0]$	$x,\bar{x},1/2 [\bar{u},\bar{u},0]$
4 d m.2m	$x,x,0 [0,0,0]$	$\bar{x},\bar{x},0 [0,0,0]$	$\bar{x},x,0 [0,0,0]$	$x,\bar{x},0 [0,0,0]$

Continued

No. 39.10.209

$p_{2c} 4/mmm$

2 c 4mm

0,0,z [0,0,0]

0,0, \bar{z} [0,0,0]

1 b 4/m'mm

0,0,1/2 [0,0,0]

1 a 4/mmm

0,0,0 [0,0,0]

Symmetry of special projections

Along [001] 4mm1'

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

Along [110] $p2mm1'$

$a^* = c$

Origin at x,x,0

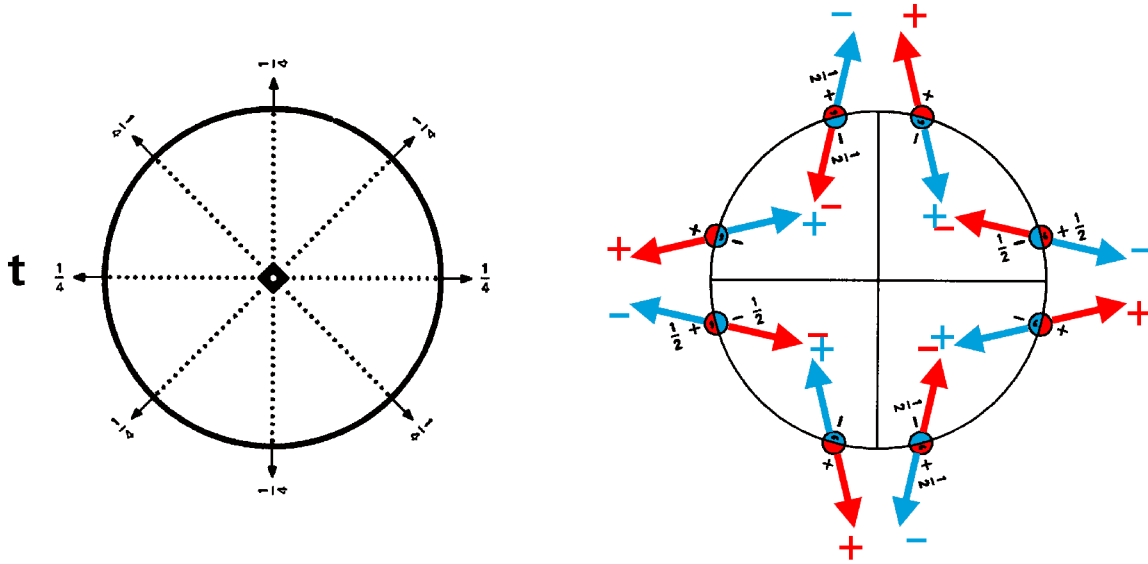
$p4/mcc$

$4/mmm$

Tetragonal

No. 40.1.210

$p4/m2/c2/c$



Origin at center ($4/m$) at $4/mcc$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|---|---|---|
| (1) 1
($1 0,0,0$) | (2) $2_{0,0,z}$
($2_z 0,0,0$) | (3) $4^+_{0,0,z}$
($4_z^+ 0,0,0$) | (4) $4^-_{0,0,z}$
($4_z^- 0,0,0$) |
| (5) $2_{0,y,1/4}$
($2_y 0,0,1/2$) | (6) $2_{x,0,1/4}$
($2_x 0,0,1/2$) | (7) $2_{x,x,1/4}$
($2_{xy} 0,0,1/2$) | (8) $2_{x,\bar{x},1/4}$
($2_{\bar{xy}} 0,0,1/2$) |
| (9) $\bar{1}_{0,0,0}$
($\bar{1} 0,0,0$) | (10) $m_{x,y,0}$
($m_z 0,0,0$) | (11) $\bar{4}^+_{0,0,z}$; $0,0,0$
($\bar{4}_z^+ 0,0,0$) | (12) $\bar{4}^-_{0,0,z}$; $0,0,0$
($\bar{4}_z^- 0,0,0$) |
| (13) $c_{(0,0,1/2)}$ $x,0,z$
($m_y 0,0,1/2$) | (14) $c_{(0,0,1/2)}$ $0,y,z$
($m_x 0,0,1/2$) | (15) $c_{(0,0,1/2)}$ x,\bar{x},z
($m_{xy} 0,0,1/2$) | (16) $c_{(0,0,1/2)}$ x,x,z
($m_{\bar{xy}} 0,0,1/2$) |

Generators selected (1); t(0,0,1); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]
	(5) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	(6) x, $\bar{y},\bar{z}+1/2$ [u, \bar{v},\bar{w}]	(7) y,x, $\bar{z}+1/2$ [v,u, \bar{w}]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y, \bar{z} [\bar{u},\bar{v},w]	(11) y, \bar{x},\bar{z} [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v, \bar{u},w]
	(13) x, $\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	(14) $\bar{x},y,z+1/2$ [u, \bar{v},\bar{w}]	(15) $\bar{y},\bar{x},z+1/2$ [v,u, \bar{w}]	(16) y,x,z+1/2 [\bar{v},\bar{u},\bar{w}]
8 f m..	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0,w]	y, $\bar{x},0$ [0,0,w]
	$\bar{x},y,1/2$ [0,0, \bar{w}]	x, $\bar{y},1/2$ [0,0, \bar{w}]	y,x,1/2 [0,0, \bar{w}]	$\bar{y},\bar{x},1/2$ [0,0, \bar{w}]
8 e .2.	x,0,1/4 [u,0,0]	$\bar{x},0,1/4$ [$\bar{u},0,0$]	0,x,1/4 [0,u,0]	0, $\bar{x},1/4$ [0, $\bar{u},0$]
	$\bar{x},0,3/4$ [u,0,0]	x,0,3/4 [$\bar{u},0,0$]	0, $\bar{x},3/4$ [0,u,0]	0,x,3/4 [0, $\bar{u},0$]
8 d ..2	x,x,1/4 [u,u,0]	$\bar{x},\bar{x},1/4$ [$\bar{u},\bar{u},0$]	$\bar{x},x,1/4$ [$\bar{u},u,0$]	x, $\bar{x},1/4$ [u, $\bar{u},0$]
	$\bar{x},\bar{x},3/4$ [u,u,0]	x,x,3/4 [$\bar{u},\bar{u},0$]	x, $\bar{x},3/4$ [$\bar{u},u,0$]	$\bar{x},x,3/4$ [u, $\bar{u},0$]
4 c 4..	0,0,z [0,0,w]	0,0, $\bar{z}+1/2$ [0,0, \bar{w}]	0,0, \bar{z} [0,0,w]	0,0,z+1/2[0,0, \bar{w}]
2 b 4/m..	0,0,0 [0,0,w]	0,0,1/2 [0,0, \bar{w}]		
2 a 422	0,0,1/4 [0,0,0]	0,0,3/4 [0,0,0]		

Symmetry of special projections

Along [001] 4mm1'	Along [100] $p_{2a^*} 2'mm'$ $a^* = c/2$	Along [110] $p_{2a^*} 2'mm'$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

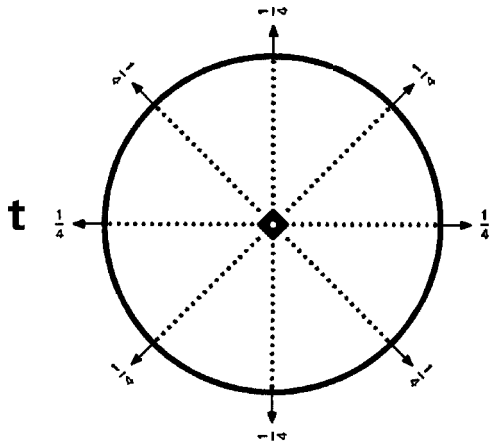
$p4/mcc1'$

$4/mmm1'$

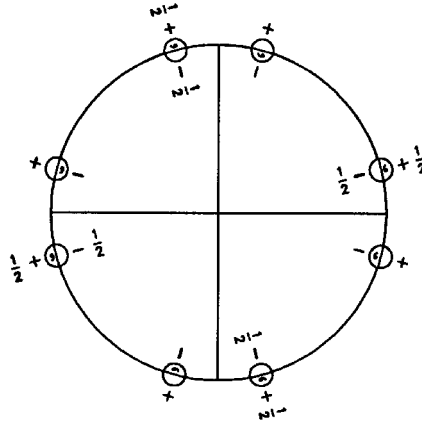
Tetragonal

No. 40.2.211

$p4/m2/c2/c1'$



1'



Origin at center ($4/m1'$) at $4/mcc1'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

For 1 + set

- | | | | |
|---|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,1/4
(2 _y 0,0,1/2) | (6) 2 x,0,1/4
(2 _x 0,0,1/2) | (7) 2 x,x,1/4
(2 _{xy} 0,0,1/2) | (8) 2 x, \bar{x} ,1/4
(2 _{xy} 0,0,1/2) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (13) c (0,0,1/2) x,0,z
(m _y 0,0,1/2) | (14) c (0,0,1/2) 0,y,z
(m _x 0,0,1/2) | (15) c (0,0,1/2) x, \bar{x} ,z
(m _{xy} 0,0,1/2) | (16) c (0,0,1/2) x,x,z
(m _{xy} 0,0,1/2) |

For 1' + set

- | | | | |
|---|---|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 4 ⁺ ' 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2' 0,y,1/4
(2 _y 0,0,1/2)' | (6) 2' x,0,1/4
(2 _x 0,0,1/2)' | (7) 2' x,x,1/4
(2 _{xy} 0,0,1/2)' | (8) 2' x, \bar{x} ,1/4
(2 _{xy} 0,0,1/2)' |
| (9) $\bar{1}'$ 0,0,0
($\bar{1}$ 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (12) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
| (13) c' (0,0,1/2) x,0,z
(m _y 0,0,1/2)' | (14) c' (0,0,1/2) 0,y,z
(m _x 0,0,1/2)' | (15) c' (0,0,1/2) x, \bar{x} ,z
(m _{xy} 0,0,1/2)' | (16) c' (0,0,1/2) x,x,z
(m _{xy} 0,0,1/2)' |

Generators selected (1); t(0,0,1)'; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(0,0,1)'		
16 g 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]	(3) \bar{y},x,z [0,0,0]	(4) y, \bar{x},z [0,0,0]
	(5) $\bar{x},y,\bar{z}+1/2$ [0,0,0]	(6) x, $\bar{y},\bar{z}+1/2$ [0,0,0]	(7) y,x, $\bar{z}+1/2$ [0,0,0]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [0,0,0]
	(9) \bar{x},\bar{y},\bar{z} [0,0,0]	(10) x,y, \bar{z} [0,0,0]	(11) y, \bar{x},\bar{z} [0,0,0]	(12) \bar{y},x,\bar{z} [0,0,0]
	(13) x, $\bar{y},z+1/2$ [0,0,0]	(14) $\bar{x},y,z+1/2$ [0,0,0]	(15) $\bar{y},\bar{x},z+1/2$ [0,0,0]	(16) y,x,z+1/2 [0,0,0]
8 f m..1'	x,y,0 [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]	$\bar{y},x,0$ [0,0,0]	y, $\bar{x},0$ [0,0,0]
	$\bar{x},y,1/2$ [0,0,0]	x, $\bar{y},1/2$ [0,0,0]	y,x,1/2 [0,0,0]	$\bar{y},\bar{x},1/2$ [0,0,0]
8 e .2.1'	x,0,1/4 [0,0,0]	$\bar{x},0,1/4$ [0,0,0]	0,x,1/4 [0,0,0]	0, $\bar{x},1/4$ [0,0,0]
	$\bar{x},0,3/4$ [0,0,0]	x,0,3/4 [0,0,0]	0, $\bar{x},3/4$ [0,0,0]	0,x,3/4 [0,0,0]
8 d ..21'	x,x,1/4 [0,0,0]	$\bar{x},\bar{x},1/4$ [0,0,0]	$\bar{x},x,1/4$ [0,0,0]	x, $\bar{x},1/4$ [0,0,0]
	$\bar{x},\bar{x},3/4$ [0,0,0]	x,x,3/4 [0,0,0]	x, $\bar{x},3/4$ [0,0,0]	$\bar{x},x,3/4$ [0,0,0]
4 c 4..1'	0,0,z [0,0,0]	0,0, $\bar{z}+1/2$ [0,0,0]	0,0, \bar{z} [0,0,0]	0,0,z+1/2 [0,0,0]
2 b 4/m..1'	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]		
2 a 4221'	0,0,1/4 [0,0,0]	0,0,3/4 [0,0,0]		

Symmetry of special projections

Along [001] 4mm1'	Along [100] p2mm1'	Along [110] p2mm1'
Origin at 0,0,z	a* = c/2 Origin at x,0,0	a* = c/2 Origin at x,x,0

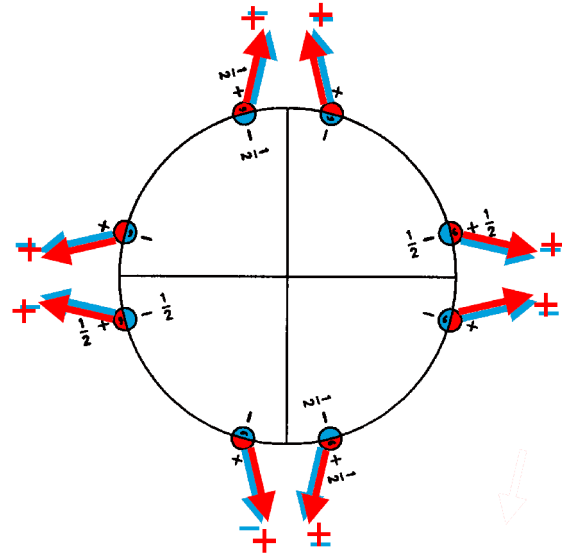
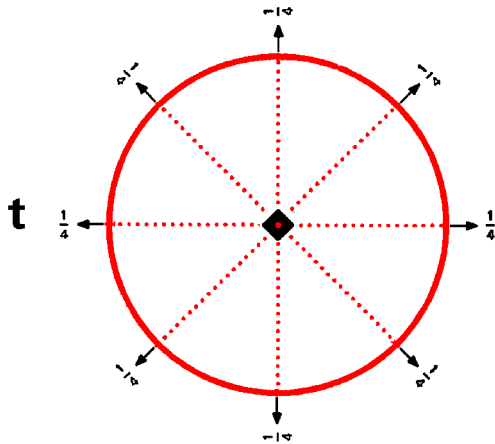
$p4/m'c'c'$

$4/m'm'm'$

Tetragonal

No. 40.3.212

$p4/m'2/c'2/c'$



Origin at center ($4/m'$) at $4/m'c'c'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,1/4
(2 _y 0,0,1/2) | (6) 2 x,0,1/4
(2 _x 0,0,1/2) | (7) 2 x,x,1/4
(2 _{xy} 0,0,1/2) | (8) 2 x, \bar{x} ,1/4
(2 _{\bar{xy}} 0,0,1/2) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z 0,0,0)' | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻¹ 0,0,0)' |
| (13) c' (0,0,1/2) x,0,z
(m _y 0,0,1/2)' | (14) c' (0,0,1/2) 0,y,z
(m _x 0,0,1/2)' | (15) c' (0,0,1/2) x, \bar{x} ,z
(m _{xy} 0,0,1/2)' | (16) c' (0,0,1/2) x,x,z
(m _{\bar{xy}} 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 g 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z [\bar{v},u,w]$	(4) $y,\bar{x},z [v,\bar{u},w]$
	(5) $\bar{x},y,\bar{z}+1/2 [\bar{u},v,\bar{w}]$	(6) $x,\bar{y},\bar{z}+1/2 [u,\bar{v},\bar{w}]$	(7) $y,x,\bar{z}+1/2 [v,u,\bar{w}]$	(8) $\bar{y},\bar{x},\bar{z}+1/2 [\bar{v},\bar{u},\bar{w}]$
	(9) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(10) $x,y,\bar{z} [u,v,\bar{w}]$	(11) $y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]$	(12) $\bar{y},x,\bar{z} [\bar{v},u,\bar{w}]$
	(13) $x,\bar{y},z+1/2 [u,\bar{v},w]$	(14) $\bar{x},y,z+1/2 [\bar{u},v,w]$	(15) $\bar{y},\bar{x},z+1/2 [\bar{v},\bar{u},w]$	(16) $y,x,z+1/2 [v,u,w]$
8 f m'..	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$	$\bar{y},x,0 [\bar{v},u,0]$	$y,\bar{x},0 [v,\bar{u},0]$
	$\bar{x},y,1/2 [\bar{u},v,0]$	$x,\bar{y},1/2 [u,\bar{v},0]$	$y,x,1/2 [v,u,0]$	$\bar{y},\bar{x},1/2 [\bar{v},\bar{u},0]$
8 e .2.	$x,0,1/4 [u,0,0]$	$\bar{x},0,1/4 [\bar{u},0,0]$	$0,x,1/4 [0,u,0]$	$0,\bar{x},1/4 [0,\bar{u},0]$
	$\bar{x},0,3/4 [\bar{u},0,0]$	$x,0,3/4 [u,0,0]$	$0,\bar{x},3/4 [0,\bar{u},0]$	$0,x,3/4 [0,u,0]$
8 d ..2	$x,x,1/4 [u,u,0]$	$\bar{x},\bar{x},1/4 [\bar{u},\bar{u},0]$	$\bar{x},x,1/4 [\bar{u},u,0]$	$x,\bar{x},1/4 [u,\bar{u},0]$
	$\bar{x},\bar{x},3/4 [\bar{u},\bar{u},0]$	$x,x,3/4 [u,u,0]$	$x,\bar{x},3/4 [u,\bar{u},0]$	$\bar{x},x,3/4 [\bar{u},u,0]$
4 c 4..	$0,0,z [0,0,w]$	$0,0,\bar{z}+1/2 [0,0,\bar{w}]$	$0,0,\bar{z} [0,0,\bar{w}]$	$0,0,z+1/2 [0,0,w]$
2 b 4/m'..	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$		
2 a 422	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$		

Symmetry of special projections

Along [001] $4m'm'$	Along [100] $p2m'm'$	Along [110] $p2m'm'$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at x,x,0

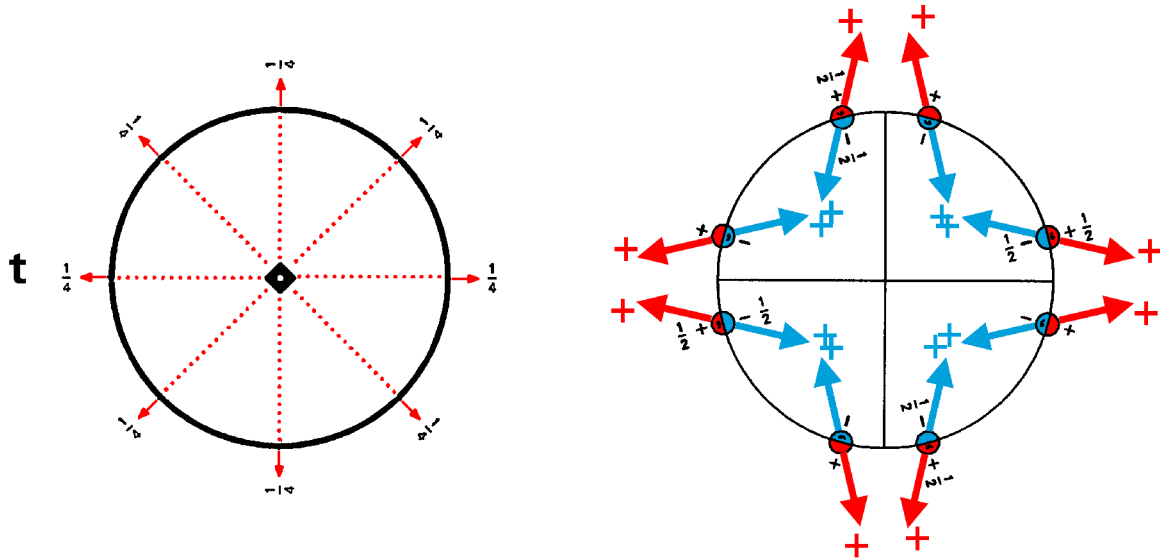
$p4/mc'c'$

$4/mm'm'$

Tetragonal

No. 40.4.213

$p4/m2'c'2'/c'$



Origin at center ($4/m$) at $4/mc'c'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^+ $0,0,z$
(4_z 0,0,0) | (4) 4^- $0,0,z$
(4_z^{-1} 0,0,0) |
| (5) $2'$ $0,y,1/4$
(2_y 0,0,1/2)' | (6) $2'$ $x,0,1/4$
(2_x 0,0,1/2)' | (7) $2'$ $x,x,1/4$
(2_{xy} 0,0,1/2)' | (8) $2'$ $x,\bar{x},1/4$
($2_{\bar{xy}}$ 0,0,1/2)' |
| (9) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (10) m $x,y,0$
(m_z 0,0,0) | (11) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0) | (12) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0) |
| (13) c' $(0,0,1/2)$ $x,0,z$
(m_y 0,0,1/2)' | (14) c' $(0,0,1/2)$ $0,y,z$
(m_x 0,0,1/2)' | (15) c' $(0,0,1/2)$ x,\bar{x},z
(m_{xy} 0,0,1/2)' | (16) c' $(0,0,1/2)$ x,x,z
($m_{\bar{xy}}$ 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
	(5) $\bar{x},y,\bar{z}+1/2$ [u,\bar{v},w]	(6) $x,\bar{y},\bar{z}+1/2$ [\bar{u},v,w]	(7) $y,x,\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y,\bar{z} [\bar{u},\bar{v},w]	(11) y,\bar{x},\bar{z} [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v,\bar{u},w]
	(13) $x,\bar{y},z+1/2$ [u,\bar{v},w]	(14) $\bar{x},y,z+1/2$ [\bar{u},v,w]	(15) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(16) $y,x,z+1/2$ [v,u,w]
8 f m..	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0,w]	$y,\bar{x},0$ [0,0,w]
	$\bar{x},y,1/2$ [0,0,w]	$x,\bar{y},1/2$ [0,0,w]	$y,x,1/2$ [0,0,w]	$\bar{y},\bar{x},1/2$ [0,0,w]
8 e .2'	x,0,1/4 [0,v,w]	$\bar{x},0,1/4$ [0, \bar{v},w]	0,x,1/4 [$\bar{v},0,w$]	0, $\bar{x},1/4$ [v,0,w]
	$\bar{x},0,3/4$ [0,v,w]	$x,0,3/4$ [0, \bar{v},w]	0, $\bar{x},3/4$ [$\bar{v},0,w$]	0,x,3/4 [v,0,w]
8 d ..2'	x,x,1/4 [u, \bar{u},w]	$\bar{x},\bar{x},1/4$ [\bar{u},u,w]	$\bar{x},x,1/4$ [u,u,w]	x, $\bar{x},1/4$ [\bar{u},\bar{u},w]
	$\bar{x},\bar{x},3/4$ [u, \bar{u},w]	$x,x,3/4$ [\bar{u},u,w]	$x,\bar{x},3/4$ [u,u,w]	$\bar{x},x,3/4$ [\bar{u},\bar{u},w]
4 c 4..	0,0,z [0,0,w]	0,0, $\bar{z}+1/2$ [0,0,w]	0,0, \bar{z} [0,0,w]	0,0,z+1/2[0,0,w]
2 b 4/m..	0,0,0 [0,0,w]	0,0,1/2 [0,0,w]		
2 a 42'2'	0,0,1/4 [0,0,w]	0,0,3/4 [0,0,w]		

Symmetry of special projections

Along [001] 4mm1'	Along [100] p2'mm'	Along [110] p2'mm'
Origin at 0,0,z	a* = c/2 Origin at x,0,0	a* = c/2 Origin at x,x,0

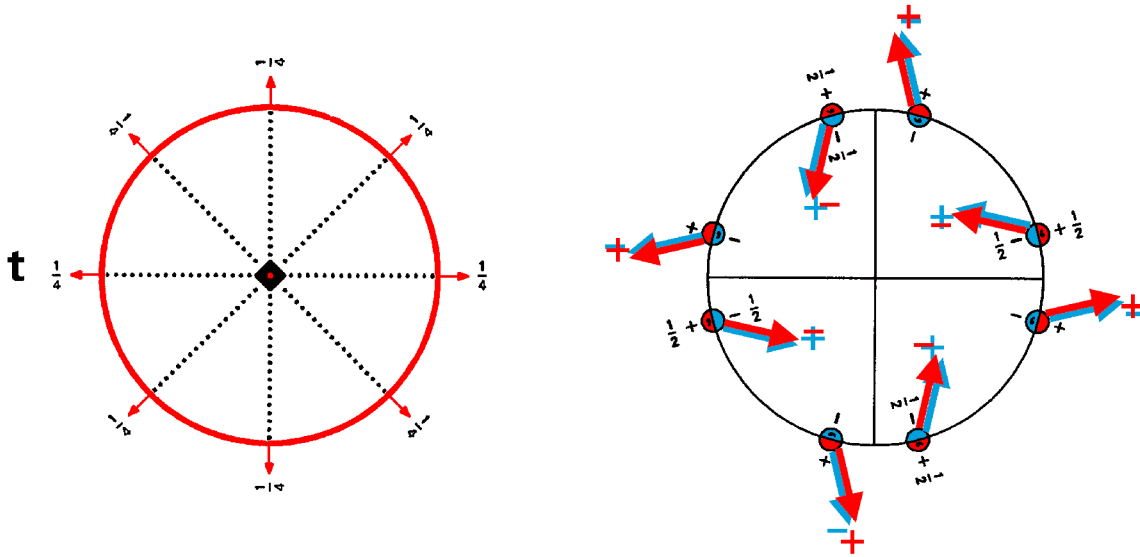
$p4/m'cc$

$4/m'mm$

Tetragonal

No. 40.5.214

$p4/m'2'/c2'/c$



Origin at center ($4/m'$) at $4/m'cc$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^+ $0,0,z$
(4_z 0,0,0) | (4) 4^- $0,0,z$
(4_z^{-1} 0,0,0) |
| (5) $2'$ $0,y,1/4$
(2_y 0,0,1/2)' | (6) $2'$ $x,0,1/4$
(2_x 0,0,1/2)' | (7) $2'$ $x,x,1/4$
(2_{xy} 0,0,1/2)' | (8) $2'$ $x,\bar{x},1/4$
($2_{\bar{xy}}$ 0,0,1/2)' |
| (9) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (10) m' $x,y,0$
(m_z 0,0,0)' | (11) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0)' | (12) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0)' |
| (13) c $(0,0,1/2)$ $x,0,z$
(m_y 0,0,1/2) | (14) c $(0,0,1/2)$ $0,y,z$
(m_x 0,0,1/2) | (15) c $(0,0,1/2)$ x,\bar{x},z
(m_{xy} 0,0,1/2) | (16) c $(0,0,1/2)$ x,x,z
($m_{\bar{xy}}$ 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
	(5) $\bar{x},y,\bar{z}+1/2$ [u,\bar{v},w]	(6) $x,\bar{y},\bar{z}+1/2$ [\bar{u},v,w]	(7) $y,x,\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y,\bar{z} [u,v,\bar{w}]	(11) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(13) $x,\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	(14) $\bar{x},y,z+1/2$ [u,\bar{v},\bar{w}]	(15) $\bar{y},\bar{x},z+1/2$ [v,u,\bar{w}]	(16) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]
8 f m'..	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [$\bar{v},u,0$]	$y,\bar{x},0$ [$v,\bar{u},0$]
	$\bar{x},y,1/2$ [$u,\bar{v},0$]	$x,\bar{y},1/2$ [$\bar{u},v,0$]	$y,x,1/2$ [$\bar{v},\bar{u},0$]	$\bar{y},\bar{x},1/2$ [$v,u,0$]
8 e .2'	x,0,1/4 [0,v,w]	$\bar{x},0,1/4$ [0, \bar{v},w]	0,x,1/4 [$\bar{v},0,w$]	0, $\bar{x},1/4$ [$v,0,w$]
	$\bar{x},0,3/4$ [0, \bar{v},\bar{w}]	$x,0,3/4$ [0,v, \bar{w}]	0, $\bar{x},3/4$ [$v,0,\bar{w}$]	0,x,3/4 [$\bar{v},0,\bar{w}$]
8 d ..2'	x,x,1/4 [u, \bar{u},w]	$\bar{x},\bar{x},1/4$ [\bar{u},u,w]	$\bar{x},x,1/4$ [u,u,w]	x, $\bar{x},1/4$ [\bar{u},\bar{u},w]
	$\bar{x},\bar{x},3/4$ [\bar{u},u,\bar{w}]	$x,x,3/4$ [u, \bar{u},\bar{w}]	$x,\bar{x},3/4$ [\bar{u},\bar{u},\bar{w}]	$\bar{x},x,3/4$ [u,u, \bar{w}]
4 c 4..	0,0,z [0,0,w]	0,0, $\bar{z}+1/2$ [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]	0,0,z+1/2[0,0, \bar{w}]
2 b 4/m'..	0,0,0 [0,0,0]	0,0,1/2 [0,0,0]		
2 a 42'2'	0,0,1/4 [0,0,w]	0,0,3/4 [0,0, \bar{w}]		

Symmetry of special projections

Along [001] 4mm	Along [100] $p_{2a^*}2'mm'$ $a^* = c/2$	Along [110] $p_{2a^*}2'mm'$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

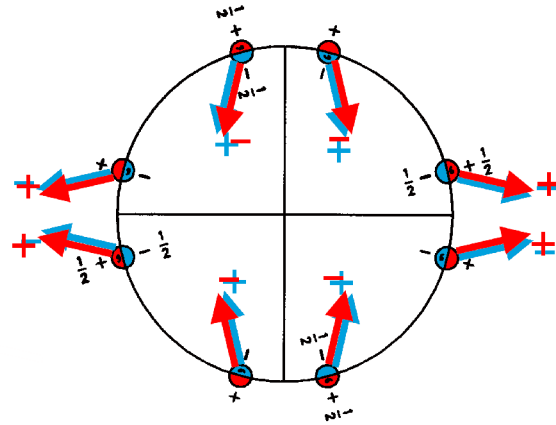
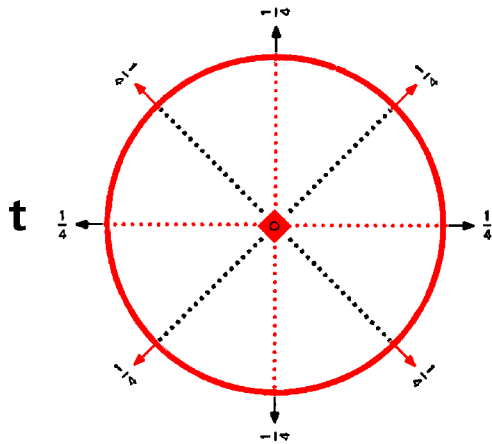
$p4'/m'c'c$

$4'/m'm'm$

Tetragonal

No. 40.6.215

$p4'/m'2/c'2'/c$



Origin at center ($4'/m'$) at $4'/m'c'c$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 0,y,1/4
(2 _y 0,0,1/2) | (6) 2 x,0,1/4
(2 _x 0,0,1/2) | (7) 2' x,x,1/4
(2 _{xy} 0,0,1/2)' | (8) 2' x,x̄,1/4
(2 _{x̄y} 0,0,1/2)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z 0,0,0) | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻¹ 0,0,0) |
| (13) c' (0,0,1/2) x,0,z
(m _y 0,0,1/2)' | (14) c' (0,0,1/2) 0,y,z
(m _x 0,0,1/2)' | (15) c (0,0,1/2) x,x̄,z
(m _{xy} 0,0,1/2) | (16) c (0,0,1/2) x,x,z
(m _{x̄y} 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]
	(5) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	(6) $x,\bar{y},\bar{z}+1/2$ [u,\bar{v},\bar{w}]	(7) $y,x,\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y,\bar{z} [u,v,\bar{w}]	(11) y,\bar{x},\bar{z} [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v,\bar{u},w]
	(13) $x,\bar{y},z+1/2$ [u,\bar{v},w]	(14) $\bar{x},y,z+1/2$ [\bar{u},v,w]	(15) $\bar{y},\bar{x},z+1/2$ [v,u,\bar{w}]	(16) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]
8 f $m'..$	$x,y,0$ [$u,v,0$]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [$v,\bar{u},0$]	$y,\bar{x},0$ [$\bar{v},u,0$]
	$\bar{x},y,1/2$ [$\bar{u},v,0$]	$x,\bar{y},1/2$ [$u,\bar{v},0$]	$y,x,1/2$ [$\bar{v},\bar{u},0$]	$\bar{y},\bar{x},1/2$ [$v,u,0$]
8 e $.2.$	$x,0,1/4$ [$u,0,0$]	$\bar{x},0,1/4$ [$\bar{u},0,0$]	$0,x,1/4$ [$0,\bar{u},0$]	$0,\bar{x},1/4$ [$0,u,0$]
	$\bar{x},0,3/4$ [$\bar{u},0,0$]	$x,0,3/4$ [$u,0,0$]	$0,\bar{x},3/4$ [$0,u,0$]	$0,x,3/4$ [$0,\bar{u},0$]
8 d $..2'$	$x,x,1/4$ [u,\bar{u},w]	$\bar{x},\bar{x},1/4$ [\bar{u},u,w]	$\bar{x},x,1/4$ [\bar{u},\bar{u},\bar{w}]	$x,\bar{x},1/4$ [u,u,\bar{w}]
	$\bar{x},\bar{x},3/4$ [\bar{u},u,\bar{w}]	$x,x,3/4$ [u,\bar{u},\bar{w}]	$x,\bar{x},3/4$ [u,u,w]	$\bar{x},x,3/4$ [\bar{u},\bar{u},w]
4 c $4'..$	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}+1/2$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	$0,0,z+1/2$ [$0,0,0$]
2 b $4'/m'..$	$0,0,0$ [$0,0,0$]	$0,0,1/2$ [$0,0,0$]		
2 a $4'22'$	$0,0,1/4$ [$0,0,0$]	$0,0,3/4$ [$0,0,0$]		

Symmetry of special projections

Along [001] $4'm'm'$	Along [100] $p2m'm'$	Along [110] $p_{2a^*}2m'm'$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c/2$ Origin at $x,x,0$

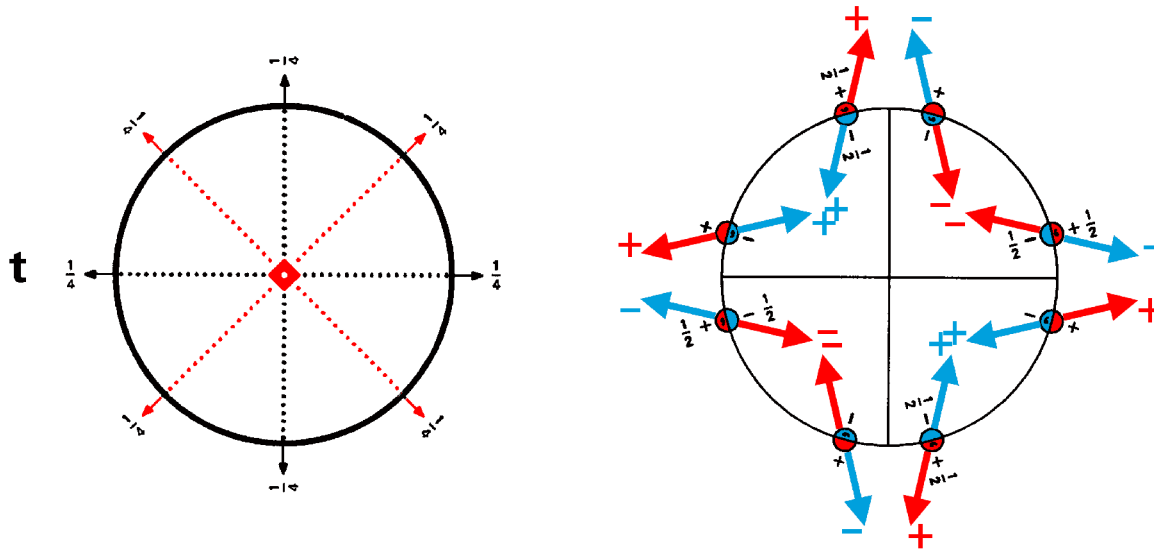
$p4'/mcc'$

$4'/mmm'$

Tetragonal

No. 40.7.216

$p4'/m2/c2'/c'$



Origin at center ($4'/m$) at $4'/mcc'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 0,y,1/4
(2 _y 0,0,1/2) | (6) 2 x,0,1/4
(2 _x 0,0,1/2) | (7) 2' x,x,1/4
(2 _{xy} 0,0,1/2)' | (8) 2' x,x̄,1/4
(2 _{x̄y} 0,0,1/2)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z 0,0,0)' | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻¹ 0,0,0)' |
| (13) c (0,0,1/2) x,0,z
(m _y 0,0,1/2) | (14) c (0,0,1/2) 0,y,z
(m _x 0,0,1/2) | (15) c' (0,0,1/2) x,x̄,z
(m _{xy} 0,0,1/2)' | (16) c' (0,0,1/2) x,x,z
(m _{x̄y} 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (3); (5); (9)

Positions

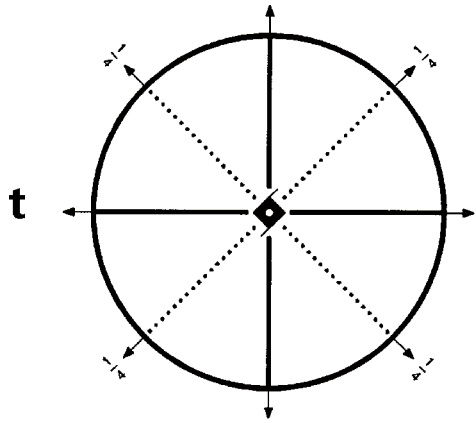
	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]
	(5) $\bar{x},y,\bar{z}+1/2$ [\bar{u},v,\bar{w}]	(6) $x,\bar{y},\bar{z}+1/2$ [u,\bar{v},\bar{w}]	(7) $y,x,\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y,\bar{z} [\bar{u},\bar{v},w]	(11) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(13) $x,\bar{y},z+1/2$ [\bar{u},v,\bar{w}]	(14) $\bar{x},y,z+1/2$ [u,\bar{v},\bar{w}]	(15) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(16) $y,x,z+1/2$ [v,u,w]
8 f m..	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0, \bar{w}]	$y,\bar{x},0$ [0,0, \bar{w}]
	$\bar{x},y,1/2$ [0,0, \bar{w}]	$x,\bar{y},1/2$ [0,0, \bar{w}]	$y,x,1/2$ [0,0,w]	$\bar{y},\bar{x},1/2$ [0,0,w]
8 e .2.	$x,0,1/4$ [u,0,0]	$\bar{x},0,1/4$ [$\bar{u},0,0$]	$0,x,1/4$ [0, $\bar{u},0$]	$0,\bar{x},1/4$ [0,u,0]
	$\bar{x},0,3/4$ [u,0,0]	$x,0,3/4$ [$\bar{u},0,0$]	$0,\bar{x},3/4$ [0, $\bar{u},0$]	$0,x,3/4$ [0,u,0]
8 d ..2'	$x,x,1/4$ [u, \bar{u},w]	$\bar{x},\bar{x},1/4$ [\bar{u},u,w]	$\bar{x},x,1/4$ [\bar{u},\bar{u},\bar{w}]	$x,\bar{x},1/4$ [u,u, \bar{w}]
	$\bar{x},\bar{x},3/4$ [u, \bar{u},w]	$x,x,3/4$ [\bar{u},u,w]	$x,\bar{x},3/4$ [\bar{u},\bar{u},\bar{w}]	$\bar{x},x,3/4$ [u,u, \bar{w}]
4 c 4'..	$0,0,z$ [0,0,0]	$0,0,\bar{z}+1/2$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	$0,0,z+1/2$ [0,0,0]
2 b 4'/m..	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]		
2 a 4'22'	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]		

Symmetry of special projections

Along [001] 4mm1'	Along [100] $p_{2a} \cdot 2'mm'$ $a^* = c/2$	Along [110] $p2'mm'$ $a^* = c/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

$p4_2/mmc$

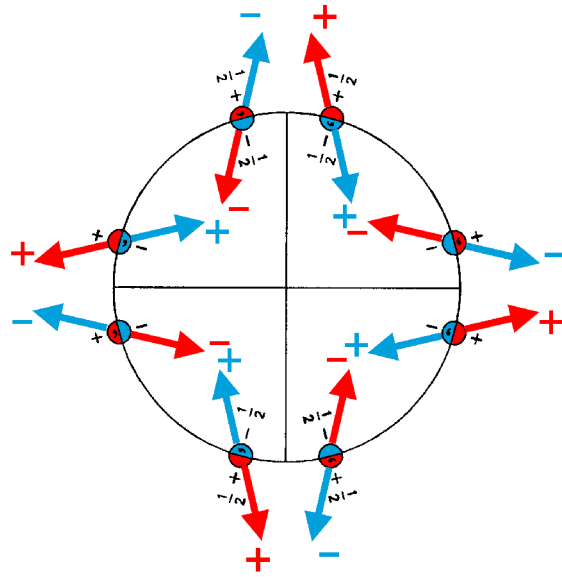
No. 41.1.217



$4/mmm$

$p4_2/m2/m2/c$

Tetragonal



Origin at center (mmm) at $4_2/m2/mc$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2) | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,1/4
(2 _{xy} 0,0,1/2) | (8) 2 x, \bar{x} ,1/4
(2 _{\bar{xy}} 0,0,1/2) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,1/4
($\bar{4}_z^+$ 0,0,1/2) | (12) $\bar{4}^-$ 0,0,z; 0,0,1/4
($\bar{4}_z^-$ 0,0,1/2) |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) c (0,0,1/2) x, \bar{x} ,z
(m _{xy} 0,0,1/2) | (16) c (0,0,1/2) x,x,z
(m _{\bar{xy}} 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z+1/2 [\bar{v},u,w]$	(4) $y,\bar{x},z+1/2 [v,\bar{u},w]$
	(5) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(6) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$	(7) $y,x,\bar{z}+1/2 [v,u,\bar{w}]$	(8) $\bar{y},\bar{x},\bar{z}+1/2 [\bar{v},\bar{u},\bar{w}]$
	(9) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(10) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(11) $y,\bar{x},\bar{z}+1/2 [\bar{v},u,w]$	(12) $\bar{y},x,\bar{z}+1/2 [v,\bar{u},w]$
	(13) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(14) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(15) $\bar{y},\bar{x},z+1/2 [v,u,\bar{w}]$	(16) $y,x,z+1/2 [\bar{v},\bar{u},\bar{w}]$
8 h .m.	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$	$\bar{y},0,z+1/2 [0,u,0]$	$y,0,z+1/2 [0,\bar{u},0]$
	$0,y,\bar{z} [\bar{u},0,0]$	$0,\bar{y},\bar{z} [u,0,0]$	$y,0,\bar{z}+1/2 [0,u,0]$	$\bar{y},0,\bar{z}+1/2 [0,\bar{u},0]$
8 g m..	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{y},x,1/2 [0,0,w]$	$y,\bar{x},1/2 [0,0,w]$
	$\bar{x},y,0 [0,0,\bar{w}]$	$x,\bar{y},0 [0,0,\bar{w}]$	$y,x,1/2 [0,0,\bar{w}]$	$\bar{y},\bar{x},1/2 [0,0,\bar{w}]$
8 f ..2	$x,x,1/4 [u,u,0]$	$\bar{x},\bar{x},1/4 [\bar{u},\bar{u},0]$	$\bar{x},x,3/4 [\bar{u},u,0]$	$x,\bar{x},3/4 [u,\bar{u},0]$
	$\bar{x},\bar{x},3/4 [u,u,0]$	$x,x,3/4 [\bar{u},\bar{u},0]$	$x,\bar{x},1/4 [\bar{u},u,0]$	$\bar{x},x,1/4 [u,\bar{u},0]$
4 e m2m.	$x,0,1/2 [0,0,0]$	$\bar{x},0,1/2 [0,0,0]$	$0,x,0 [0,0,0]$	$0,\bar{x},0 [0,0,0]$
4 d m2m.	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$	$0,x,1/2 [0,0,0]$	$0,\bar{x},1/2 [0,0,0]$
4 c 2mm.	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	$0,0,z+1/2 [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$
2 b $\bar{4}m2$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$		
2 a mmm.	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$		

Continued

No. 41.1.217

$p4_2/mmc$

Symmetry of special projections

Along [001] $4mm1'$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

Along [110] $p_{2a^*}2'mm'$

$a^* = c/2$

Origin at x,x,0

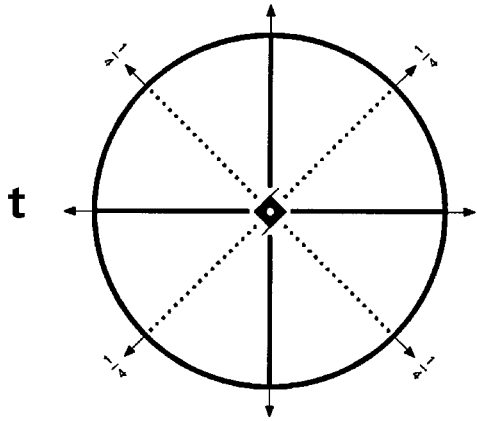
$p4_2/mmc1'$

$4/mmm1'$

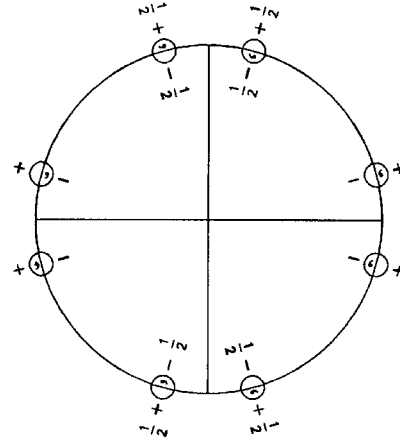
Tetragonal

No. 41.2.218

$p4_2/m2/m2/c1'$



1'



Origin at center ($mmm1'$) at $4_2/m2/mc1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

For 1 + set

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2) | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,1/4
(2 _{xy} 0,0,1/2) | (8) 2 x,x̄,1/4
(2 _{xȳ} 0,0,1/2) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,1/4
($\bar{4}_z^+$ 0,0,1/2) | (12) $\bar{4}^-$ 0,0,z; 0,0,1/4
($\bar{4}_z^-$ 0,0,1/2) |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) c (0,0,1/2) x,x̄,z
(m _{xy} 0,0,1/2) | (16) c (0,0,1/2) x,x,z
(m _{xȳ} 0,0,1/2) |

For 1' + set

- | | | | |
|---|---|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 4 ⁺ ' (0,0,1/2) 0,0,z
(4 _z 0,0,1/2)' | (4) 4 ⁻ ' (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2)' |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,1/4
(2 _{xy} 0,0,1/2)' | (8) 2' x,x̄,1/4
(2 _{xȳ} 0,0,1/2)' |
| (9) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) $\bar{4}^+$ ' 0,0,z; 0,0,1/4
($\bar{4}_z^+$ 0,0,1/2)' | (12) $\bar{4}^-$ ' 0,0,z; 0,0,1/4
($\bar{4}_z^-$ 0,0,1/2)' |
| (13) m' x,0,z
(m _y 0,0,0)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) c' (0,0,1/2) x,x̄,z
(m _{xy} 0,0,1/2)' | (16) c' (0,0,1/2) x,x,z
(m _{xȳ} 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		$1+$	$1'$	$+$
16 i $1\ 1'$	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]	(3) $\bar{y},x,z+1/2$ [0,0,0]	(4) $y,\bar{x},z+1/2$ [0,0,0]
	(5) \bar{x},y,\bar{z} [0,0,0]	(6) x,\bar{y},\bar{z} [0,0,0]	(7) $y,x,\bar{z}+1/2$ [0,0,0]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [0,0,0]
	(9) \bar{x},\bar{y},\bar{z} [0,0,0]	(10) x,y,\bar{z} [0,0,0]	(11) $y,\bar{x},\bar{z}+1/2$ [0,0,0]	(12) $\bar{y},x,\bar{z}+1/2$ [0,0,0]
	(13) x,\bar{y},z [0,0,0]	(14) \bar{x},y,z [0,0,0]	(15) $\bar{y},\bar{x},z+1/2$ [0,0,0]	(16) $y,x,z+1/2$ [0,0,0]
8 h $.m.1'$	$0,y,z$ [0,0,0]	$0,\bar{y},z$ [0,0,0]	$\bar{y},0,z+1/2$ [0,0,0]	$y,0,z+1/2$ [0,0,0]
	$0,y,\bar{z}$ [0,0,0]	$0,\bar{y},\bar{z}$ [0,0,0]	$y,0,\bar{z}+1/2$ [0,0,0]	$\bar{y},0,\bar{z}+1/2$ [0,0,0]
8 g $m..1'$	$x,y,0$ [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]	$\bar{y},x,1/2$ [0,0,0]	$y,\bar{x},1/2$ [0,0,0]
	$\bar{x},y,0$ [0,0,0]	$x,\bar{y},0$ [0,0,0]	$y,x,1/2$ [0,0,0]	$\bar{y},\bar{x},1/2$ [0,0,0]
8 f $..21'$	$x,x,1/4$ [0,0,0]	$\bar{x},\bar{x},1/4$ [0,0,0]	$\bar{x},x,3/4$ [0,0,0]	$x,\bar{x},3/4$ [0,0,0]
	$\bar{x},\bar{x},3/4$ [0,0,0]	$x,x,3/4$ [0,0,0]	$x,\bar{x},1/4$ [0,0,0]	$\bar{x},x,1/4$ [0,0,0]
4 e $m2m.1'$	$x,0,1/2$ [0,0,0]	$\bar{x},0,1/2$ [0,0,0]	$0,x,0$ [0,0,0]	$0,\bar{x},0$ [0,0,0]
4 d $m2m.1'$	$x,0,0$ [0,0,0]	$\bar{x},0,0$ [0,0,0]	$0,x,1/2$ [0,0,0]	$0,\bar{x},1/2$ [0,0,0]
4 c $2mm.1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	$0,0,z+1/2$ [0,0,0]	$0,0,\bar{z}+1/2$ [0,0,0]
2 b $\bar{4}m2\ 1'$	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]		
2 a $mmm.1'$	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]		

Continued

No. 41.2.218

$p4_2/mmc1'$

Symmetry of special projections

Along [001] $4mm'$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

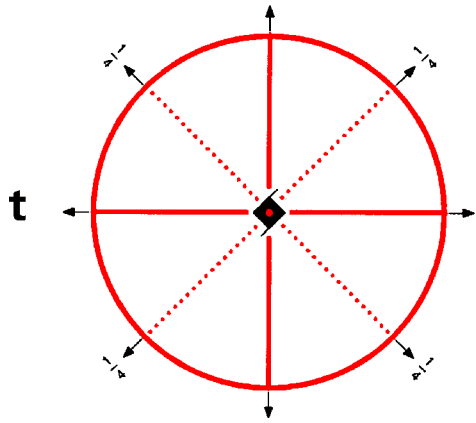
Along [110] $p2mm1'$

$a^* = c/2$

Origin at x,x,0

$p4_2/m'm'c'$

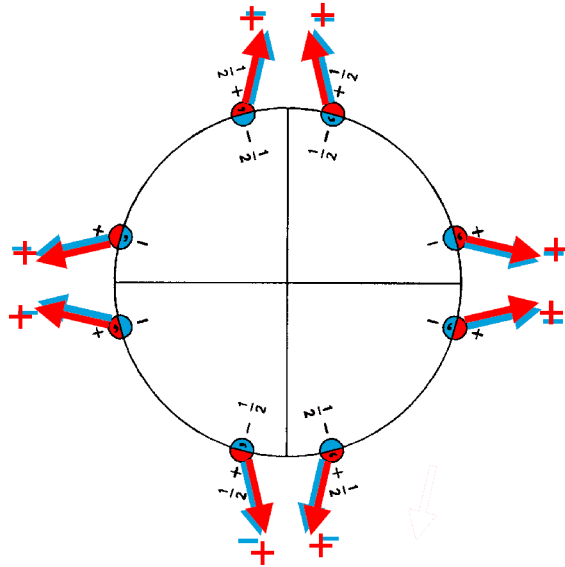
No. 41.3.219



$4/m'm'm'$

$p4_2/m'2/m'2/c'$

Tetragonal



Origin at center ($m'm'm'$) at $4_2/m'2/m'c'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2) | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,1/4
(2 _{xy} 0,0,1/2) | (8) 2 x, \bar{x} ,1/4
(2 _{\bar{xy}} 0,0,1/2) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,1/4
($\bar{4}$ _z 0,0,1/2)' | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,1/4
($\bar{4}$ _z ⁻¹ 0,0,1/2)' |
| (13) m' x,0,z
(m _y 0,0,0)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) c' (0,0,1/2) x, \bar{x} ,z
(m _{xy} 0,0,1/2)' | (16) c' (0,0,1/2) x,x,z
(m _{\bar{xy}} 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z+1/2 [\bar{v},u,w]$	(4) $y,\bar{x},z+1/2 [v,\bar{u},w]$
	(5) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(6) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$	(7) $y,x,\bar{z}+1/2 [v,u,\bar{w}]$	(8) $\bar{y},\bar{x},\bar{z}+1/2 [\bar{v},\bar{u},\bar{w}]$
	(9) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(10) $x,y,\bar{z} [u,v,\bar{w}]$	(11) $y,\bar{x},\bar{z}+1/2 [v,\bar{u},\bar{w}]$	(12) $\bar{y},x,\bar{z}+1/2 [\bar{v},u,\bar{w}]$
	(13) $x,\bar{y},z [u,\bar{v},w]$	(14) $\bar{x},y,z [\bar{u},v,w]$	(15) $\bar{y},\bar{x},z+1/2 [\bar{v},\bar{u},w]$	(16) $y,x,z+1/2 [v,u,w]$
8 h .m'	$0,y,z [0,v,w]$	$0,\bar{y},z [0,\bar{v},w]$	$\bar{y},0,z+1/2 [\bar{v},0,w]$	$y,0,z+1/2 [v,0,w]$
	$0,y,\bar{z} [0,v,\bar{w}]$	$0,\bar{y},\bar{z} [0,\bar{v},\bar{w}]$	$y,0,\bar{z}+1/2 [v,0,\bar{w}]$	$\bar{y},0,\bar{z}+1/2 [\bar{v},0,\bar{w}]$
8 g m'..	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$	$\bar{y},x,1/2 [\bar{v},u,0]$	$y,\bar{x},1/2 [v,\bar{u},0]$
	$\bar{x},y,0 [\bar{u},v,0]$	$x,\bar{y},0 [u,\bar{v},0]$	$y,x,1/2 [v,u,0]$	$\bar{y},\bar{x},1/2 [\bar{v},\bar{u},0]$
8 f ..2	$x,x,1/4 [u,u,0]$	$\bar{x},\bar{x},1/4 [\bar{u},\bar{u},0]$	$\bar{x},x,3/4 [\bar{u},u,0]$	$x,\bar{x},3/4 [u,\bar{u},0]$
	$\bar{x},\bar{x},3/4 [\bar{u},\bar{u},0]$	$x,x,3/4 [u,u,0]$	$x,\bar{x},1/4 [u,\bar{u},0]$	$\bar{x},x,1/4 [\bar{u},u,0]$
4 e m'2m'	$x,0,1/2 [u,0,0]$	$\bar{x},0,1/2 [\bar{u},0,0]$	$0,x,0 [0,u,0]$	$0,\bar{x},0 [0,\bar{u},0]$
4 d m'2m'	$x,0,0 [u,0,0]$	$\bar{x},0,0 [\bar{u},0,0]$	$0,x,1/2 [0,u,0]$	$0,\bar{x},1/2 [0,\bar{u},0]$
4 c 2m'm'	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$	$0,0,z+1/2 [0,0,w]$	$0,0,\bar{z}+1/2 [0,0,\bar{w}]$
2 b $\bar{4}'m'2$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$		
2 a m'm'm'	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$		

Continued

No. 41.3.219

$p4_2/m'm'c'$

Symmetry of special projections

Along [001] $4m'm'$

Origin at 0,0,z

Along [100] $p2m'm'$

$a^* = c$

Origin at x,0,0

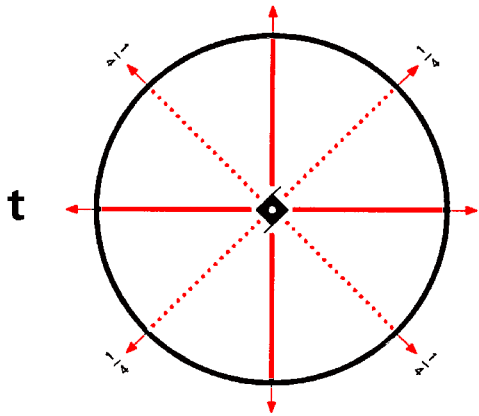
Along [110] $p2m'm'$

$a^* = c/2$

Origin at x,x,0

$p4_2/mm'c'$

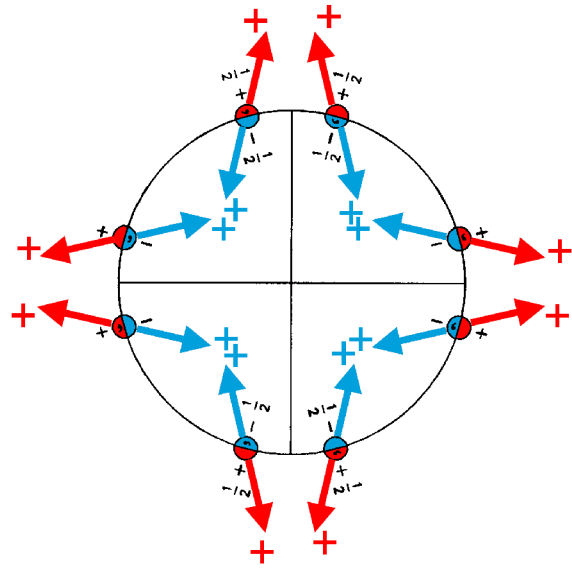
No. 41.4.220



$4/mm'm'$

Tetragonal

$p4_2/m2'/m2'/c'$



Origin at center ($m'm'm'$) at $4_2/m2'/m'c'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z ⁺ 0,0,1/2) | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻ 0,0,1/2) |
| (5) 2' _y 0,y,0
(2 _y ' 0,0,0)' | (6) 2' _x x,0,0
(2 _x ' 0,0,0)' | (7) 2' _{xy} x,x,1/4
(2 _{xy} ' 0,0,1/2)' | (8) 2' _{xy} x,̄x,1/4
(2 _{xy} ' 0,0,1/2)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m _z x,y,0
(m _z 0,0,0) | (11) $\bar{4}_z^+$ 0,0,z; 0,0,1/4
($\bar{4}_z^+$ 0,0,1/2) | (12) $\bar{4}_z^-$ 0,0,z; 0,0,1/4
($\bar{4}_z^-$ 0,0,1/2) |
| (13) m' _y x,0,z
(m _y ' 0,0,0)' | (14) m' _x 0,y,z
(m _x ' 0,0,0)' | (15) c' (0,0,1/2) x,̄x,z
(m _{xy} ' 0,0,1/2)' | (16) c' (0,0,1/2) x,x,z
(m _{xy} ' 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) $\bar{y},x,z+1/2$ [\bar{v},u,w]	(4) $y,\bar{x},z+1/2$ [v, \bar{u},w]
	(5) \bar{x},y,\bar{z} [u, \bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	(7) $y,x,\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y,\bar{z} [\bar{u},\bar{v},w]	(11) $y,\bar{x},\bar{z}+1/2$ [\bar{v},u,w]	(12) $\bar{y},x,\bar{z}+1/2$ [v, \bar{u},w]
	(13) x,\bar{y},z [u, \bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(16) $y,x,z+1/2$ [v,u,w]
8 h .m'	$0,y,z$ [0,v,w]	$0,\bar{y},z$ [0, \bar{v},w]	$\bar{y},0,z+1/2$ [$\bar{v},0,w$]	$y,0,z+1/2$ [v,0,w]
	$0,y,\bar{z}$ [0, \bar{v},w]	$0,\bar{y},\bar{z}$ [0,v,w]	$y,0,\bar{z}+1/2$ [$\bar{v},0,w$]	$\bar{y},0,\bar{z}+1/2$ [v,0,w]
8 g m..	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,1/2$ [0,0,w]	$y,\bar{x},1/2$ [0,0,w]
	$\bar{x},y,0$ [0,0,w]	$x,\bar{y},0$ [0,0,w]	$y,x,1/2$ [0,0,w]	$\bar{y},\bar{x},1/2$ [0,0,w]
8 f ..2'	$x,x,1/4$ [u, \bar{u},w]	$\bar{x},\bar{x},1/4$ [\bar{u},u,w]	$\bar{x},x,3/4$ [u,u,w]	$x,\bar{x},3/4$ [\bar{u},\bar{u},w]
	$\bar{x},\bar{x},3/4$ [u, \bar{u},w]	$x,x,3/4$ [\bar{u},u,w]	$x,\bar{x},1/4$ [u,u,w]	$\bar{x},x,1/4$ [\bar{u},\bar{u},w]
4 e m2'm'	$x,0,1/2$ [0,0,w]	$\bar{x},0,1/2$ [0,0,w]	$0,x,0$ [0,0,w]	$0,\bar{x},0$ [0,0,w]
4 d m2'm'	$x,0,0$ [0,0,w]	$\bar{x},0,0$ [0,0,w]	$0,x,1/2$ [0,0,w]	$0,\bar{x},1/2$ [0,0,w]
4 c 2m'm'	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	$0,0,z+1/2$ [0,0,w]	$0,0,\bar{z}+1/2$ [0,0,w]
2 b $\bar{4}m'2'$	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0,w]		
2 a mm'm'	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0,w]		

Continued

No. 41.4.220

$p4_2/m'm'c'$

Symmetry of special projections

Along [001] $4mm1'$

Origin at 0,0,z

Along [100] $p2'mm'$

$a^* = c$

Origin at x,0,0

Along [110] $p2'mm'$

$a^* = c/2$

Origin at x,x,0

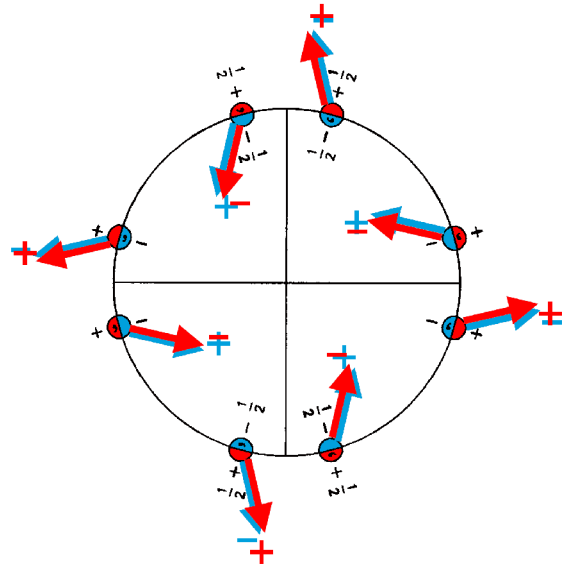
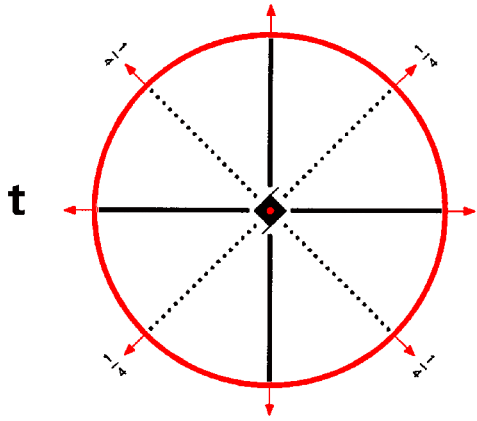
$p4_2/m'mc$

No. 41.5.221

$4/m'mm$

$p4_2/m'2'/m2'/c$

Tetragonal



Origin at center (mmm') at $4_2/m'2'/mc$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2) | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2) |
| (5) 2' _y 0,y,0
(2 _y 0,0,0)' | (6) 2' _x x,0,0
(2 _x 0,0,0)' | (7) 2' _{xy} x,x,1/4
(2 _{xy} 0,0,1/2)' | (8) 2' _{xy} x,x̄,1/4
(2 _{xy} 0,0,1/2)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (10) m' _z x,y,0
(m _z 0,0,0)' | (11) $\bar{4}_z^+$ 0,0,z; 0,0,1/4
($\bar{4}_z^+$ 0,0,1/2)' | (12) $\bar{4}_z^-$ 0,0,z; 0,0,1/4
($\bar{4}_z^-$ 0,0,1/2)' |
| (13) m _y x,0,z
(m _y 0,0,0) | (14) m _x 0,y,z
(m _x 0,0,0) | (15) c (0,0,1/2) x,x̄,z
(m _{xy} 0,0,1/2) | (16) c (0,0,1/2) x,x,z
(m _{xy} 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z+1/2 [\bar{v},u,w]$	(4) $y,\bar{x},z+1/2 [v,\bar{u},w]$
	(5) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(6) $x,\bar{y},\bar{z} [\bar{u},v,w]$	(7) $y,x,\bar{z}+1/2 [\bar{v},\bar{u},w]$	(8) $\bar{y},\bar{x},\bar{z}+1/2 [v,u,w]$
	(9) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(10) $x,y,\bar{z} [u,v,\bar{w}]$	(11) $y,\bar{x},\bar{z}+1/2 [v,\bar{u},\bar{w}]$	(12) $\bar{y},x,\bar{z}+1/2 [\bar{v},u,\bar{w}]$
	(13) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(14) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(15) $\bar{y},\bar{x},z+1/2 [v,u,\bar{w}]$	(16) $y,x,z+1/2 [\bar{v},\bar{u},\bar{w}]$
8 h .m.	$0,y,z [u,0,0]$	$0,\bar{y},z [0,\bar{u},0]$	$\bar{y},0,z+1/2 [0,u,0]$	$y,0,z+1/2 [0,\bar{u},0]$
	$0,y,\bar{z} [u,0,0]$	$0,\bar{y},\bar{z} [0,\bar{u},0]$	$y,0,\bar{z}+1/2 [0,\bar{u},0]$	$\bar{y},0,\bar{z}+1/2 [0,u,0]$
8 g m'..	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$	$\bar{y},x,1/2 [\bar{v},u,0]$	$y,\bar{x},1/2 [v,\bar{u},0]$
	$\bar{x},y,0 [u,\bar{v},0]$	$x,\bar{y},0 [\bar{u},v,0]$	$y,x,1/2 [\bar{v},\bar{u},0]$	$\bar{y},\bar{x},1/2 [v,u,0]$
8 f ..2'	$x,x,1/4 [u,\bar{u},w]$	$\bar{x},\bar{x},1/4 [\bar{u},u,w]$	$\bar{x},x,3/4 [u,u,w]$	$x,\bar{x},3/4 [\bar{u},\bar{u},w]$
	$\bar{x},\bar{x},3/4 [\bar{u},u,\bar{w}]$	$x,x,3/4 [u,\bar{u},\bar{w}]$	$x,\bar{x},1/4 [\bar{u},\bar{u},\bar{w}]$	$\bar{x},x,1/4 [u,u,\bar{w}]$
4 e m'2'm.	$x,0,1/2 [0,v,0]$	$\bar{x},0,1/2 [0,\bar{v},0]$	$0,x,0 [\bar{v},0,0]$	$0,\bar{x},0 [v,0,0]$
4 d m'2'm.	$x,0,0 [0,v,0]$	$\bar{x},0,0 [0,\bar{v},0]$	$0,x,1/2 [\bar{v},0,0]$	$0,\bar{x},1/2 [v,0,0]$
4 c 2mm.	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	$0,0,z+1/2 [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$
2 b $\bar{4}'m2'$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$		
2 a m'mm.	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$		

Continued

No. 41.5.221

$p4_2/m'mc$

Symmetry of special projections

Along [001] 4mm

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

Along [110] $p_{2a^*}2m'm'$

$a^* = c/2$

Origin at x,x,0

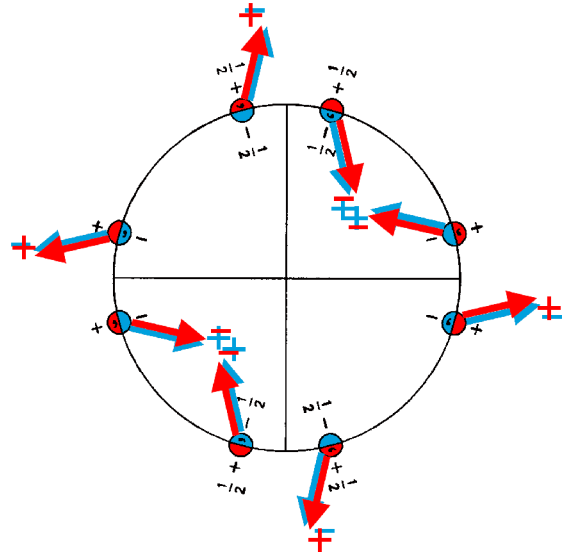
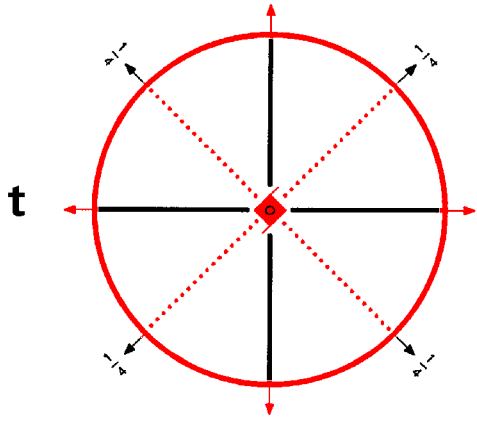
$p4_2'/m'mc'$

$4'/m'mm'$

Tetragonal

No. 41.6.222

$p4_2'/m'2'/m2/c'$



Origin at center (mmm') at $4_2'/m'2'/mc'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2)' | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2)' |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2 x,x,1/4
(2 _{xy} 0,0,1/2) | (8) 2 x,̄x,1/4
(2 _{̄xy} 0,0,1/2) |
| (9) ̄1 0,0,0
(̄1 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) ̄4 ⁺ 0,0,z; 0,0,1/4
(̄4 _z 0,0,1/2) | (12) ̄4 ⁻ 0,0,z; 0,0,1/4
(̄4 _z ⁻¹ 0,0,1/2) |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) c' (0,0,1/2) x,̄x,z
(m _{xy} 0,0,1/2)' | (16) c' (0,0,1/2) x,x,z
(m _{̄xy} 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
16 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,\bar{v},\bar{w}]$	(3) $\bar{y},x,z+1/2 [v,\bar{u},\bar{w}]$	(4) $y,\bar{x},z+1/2 [\bar{v},u,\bar{w}]$
	(5) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(6) $x,\bar{y},\bar{z} [\bar{u},v,w]$	(7) $y,x,\bar{z}+1/2 [v,u,\bar{w}]$	(8) $\bar{y},\bar{x},\bar{z}+1/2 [\bar{v},\bar{u},\bar{w}]$
	(9) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(10) $x,y,\bar{z} [u,v,\bar{w}]$	(11) $y,\bar{x},\bar{z}+1/2 [\bar{v},u,w]$	(12) $\bar{y},x,\bar{z}+1/2 [v,\bar{u},w]$
	(13) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(14) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(15) $\bar{y},\bar{x},z+1/2 [\bar{v},\bar{u},w]$	(16) $y,x,z+1/2 [v,u,w]$
8 h .m.	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$	$\bar{y},0,z+1/2 [0,\bar{u},0]$	$y,0,z+1/2 [0,u,0]$
	$0,y,\bar{z} [u,0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$	$y,0,\bar{z}+1/2 [0,u,0]$	$\bar{y},0,\bar{z}+1/2 [0,\bar{u},0]$
8 g m'..	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$	$\bar{y},x,1/2 [v,\bar{u},0]$	$y,\bar{x},1/2 [\bar{v},u,0]$
	$\bar{x},y,0 [u,\bar{v},0]$	$x,\bar{y},0 [\bar{u},v,0]$	$y,x,1/2 [v,u,0]$	$\bar{y},\bar{x},1/2 [\bar{v},\bar{u},0]$
8 f ..2	$x,x,1/4 [u,u,0]$	$\bar{x},\bar{x},1/4 [\bar{u},\bar{u},0]$	$\bar{x},x,3/4 [u,\bar{u},0]$	$x,\bar{x},3/4 [\bar{u},u,0]$
	$\bar{x},\bar{x},3/4 [\bar{u},\bar{u},0]$	$x,x,3/4 [u,u,0]$	$x,\bar{x},1/4 [\bar{u},u,0]$	$\bar{x},x,1/4 [u,\bar{u},0]$
4 e m'2'm.	$x,0,1/2 [0,v,0]$	$\bar{x},0,1/2 [0,\bar{v},0]$	$0,x,0 [v,0,0]$	$0,\bar{x},0 [\bar{v},0,0]$
4 d m'2'm.	$x,0,0 [0,v,0]$	$\bar{x},0,0 [0,\bar{v},0]$	$0,x,1/2 [v,0,0]$	$0,\bar{x},1/2 [\bar{v},0,0]$
4 c 2mm.	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	$0,0,z+1/2 [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$
2 b $\bar{4}m2$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$		
2 a m"mm.	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$		

Continued

No. 41.6.222

$p4_2'/m'mc'$

Symmetry of special projections

Along [001] $4'mm'$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

Along [110] $p2m'm'$

$a^* = c/2$

Origin at x,x,0

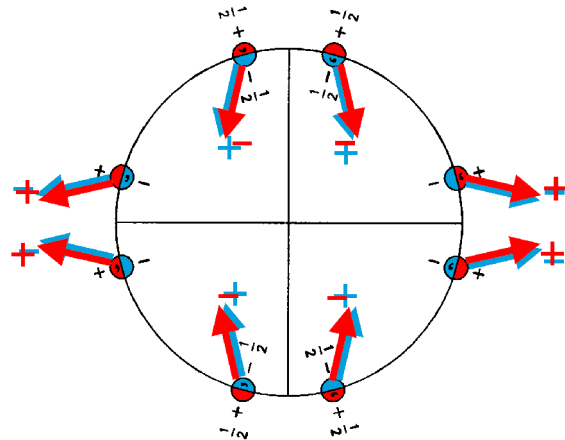
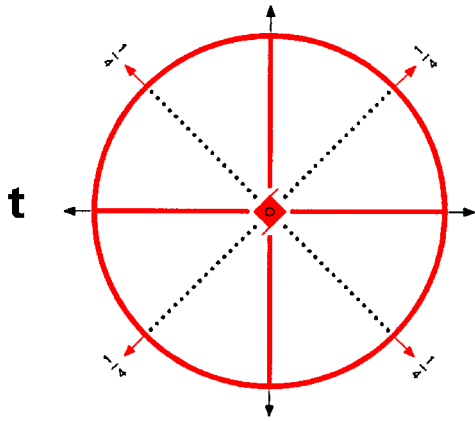
$p4_2'/m'm'c$

No. 41.7.223

$4'/m'm'm$

$p4_2'/m'2/m'2'/c$

Tetragonal



Origin at center ($m'm'm$) at $4_2'/m'2/m'c$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|---|---------------------------------------|--|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^+ $(0,0,1/2)$ $0,0,z$
(4_z 0,0,1/2)' | (4) 4^- $(0,0,1/2)$ $0,0,z$
(4_z^{-1} 0,0,1/2)' |
| (5) 2 $0,y,0$
(2_y 0,0,0) | (6) 2 $x,0,0$
(2_x 0,0,0) | (7) $2'$ $x,x,1/4$
(2_{xy} 0,0,1/2)' | (8) $2'$ $x,\bar{x},1/4$
($2_{\bar{xy}}$ 0,0,1/2)' |
| (9) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (10) m' $x,y,0$
(m_z 0,0,0)' | (11) $\bar{4}^+$ $0,0,z; 0,0,1/4$
($\bar{4}_z$ 0,0,1/2) | (12) $\bar{4}^-$ $0,0,z; 0,0,1/4$
($\bar{4}_z^{-1}$ 0,0,1/2) |
| (13) m' $x,0,z$
(m_y 0,0,0)' | (14) m' $0,y,z$
(m_x 0,0,0)' | (15) c $(0,0,1/2)$ x,\bar{x},z
(m_{xy} 0,0,1/2) | (16) c $(0,0,1/2)$ x,x,z
($m_{\bar{xy}}$ 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) $\bar{y},x,z+1/2$ [v,\bar{u},\bar{w}]	(4) $y,\bar{x},z+1/2$ [\bar{v},u,\bar{w}]
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(7) $y,x,\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y,\bar{z} [u,v,w]	(11) $y,\bar{x},\bar{z}+1/2$ [\bar{v},u,w]	(12) $\bar{y},x,\bar{z}+1/2$ [v,\bar{u},w]
	(13) x,\bar{y},z [u,\bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) $\bar{y},\bar{x},z+1/2$ [v,u,\bar{w}]	(16) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]
8 h .m'	$0,y,z$ [$0,v,w$]	$0,\bar{y},z$ [$0,\bar{v},w$]	$\bar{y},0,z+1/2$ [$v,0,\bar{w}$]	$y,0,z+1/2$ [$\bar{v},0,\bar{w}$]
	$0,y,\bar{z}$ [$0,v,\bar{w}$]	$0,\bar{y},\bar{z}$ [$0,\bar{v},\bar{w}$]	$y,0,\bar{z}+1/2$ [$\bar{v},0,w$]	$\bar{y},0,\bar{z}+1/2$ [$v,0,w$]
8 g m'..	$x,y,0$ [$u,v,0$]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,1/2$ [$v,\bar{u},0$]	$y,\bar{x},1/2$ [$\bar{v},u,0$]
	$\bar{x},y,0$ [$\bar{u},v,0$]	$x,\bar{y},0$ [$u,\bar{v},0$]	$y,x,1/2$ [$\bar{v},\bar{u},0$]	$\bar{y},\bar{x},1/2$ [$v,u,0$]
8 f ..2'	$x,x,1/4$ [u,\bar{u},w]	$\bar{x},\bar{x},1/4$ [\bar{u},u,w]	$\bar{x},x,3/4$ [\bar{u},\bar{u},\bar{w}]	$x,\bar{x},3/4$ [u,u,\bar{w}]
	$\bar{x},\bar{x},3/4$ [\bar{u},\bar{u},\bar{w}]	$x,x,3/4$ [u,u,\bar{w}]	$x,\bar{x},1/4$ [u,\bar{u},w]	$\bar{x},x,1/4$ [\bar{u},u,w]
4 e m'2m'	$x,0,1/2$ [$u,0,0$]	$\bar{x},0,1/2$ [$\bar{u},0,0$]	$0,x,0$ [$0,\bar{u},0$]	$0,\bar{x},0$ [$0,u,0$]
4 d m'2m'	$x,0,0$ [$u,0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,x,1/2$ [$0,\bar{u},0$]	$0,\bar{x},1/2$ [$0,u,0$]
4 c 2m'm'	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	$0,0,z+1/2$ [$0,0,\bar{w}$]	$0,0,\bar{z}+1/2$ [$0,0,w$]
2 b $\bar{4}m'2'$	$0,0,1/4$ [$0,0,w$]	$0,0,3/4$ [$0,0,\bar{w}$]		
2 a m'm'm'	$0,0,0$ [$0,0,0$]	$0,0,1/2$ [$0,0,0$]		

Continued

No. 41.7.223

$p4_2'/m'm'c$

Symmetry of special projections

Along [001] $4'm'm'$

Origin at 0,0,z

Along [100] $p2m'm'$

$a^* = c$

Origin at x,0,0

Along [110] $p_{2a^*}2m'm'$

$a^* = c/2$

Origin at x,x,0

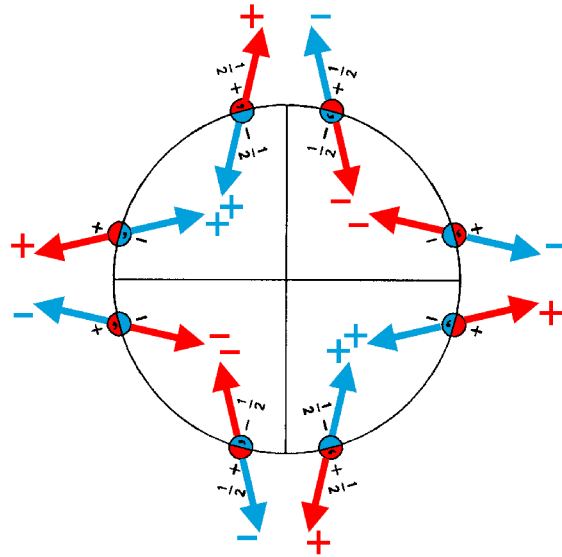
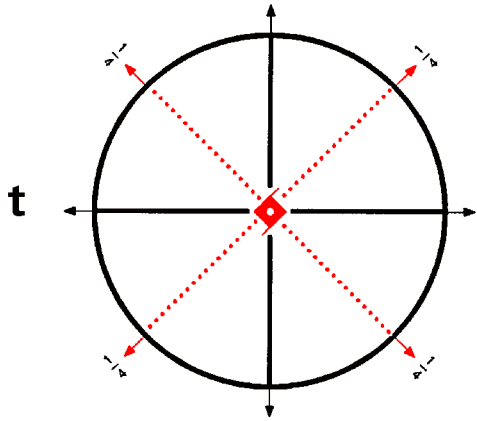
$p4_2'/mmc'$

No. 41.8.224

$4'/mmm'$

$p4_2'/m2/m2'/c'$

Tetragonal



Origin at center (mmm) at $4_2'/m2/mc'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2)' | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2)' |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2' x,x,1/4
(2 _{xy} 0,0,1/2)' | (8) 2' x,x̄,1/4
(2 _{x̄y} 0,0,1/2)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,1/4
($\bar{4}_z^+$ 0,0,1/2)' | (12) $\bar{4}^-$ 0,0,z; 0,0,1/4
($\bar{4}_z^-$ 0,0,1/2)' |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) c' (0,0,1/2) x,x̄,z
(m _{xy} 0,0,1/2)' | (16) c' (0,0,1/2) x,x,z
(m _{x̄y} 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z+1/2 [v,\bar{u},\bar{w}]$	(4) $y,\bar{x},z+1/2 [\bar{v},u,\bar{w}]$
	(5) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(6) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$	(7) $y,x,\bar{z}+1/2 [\bar{v},\bar{u},w]$	(8) $\bar{y},\bar{x},\bar{z}+1/2 [v,u,w]$
	(9) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(10) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(11) $y,\bar{x},\bar{z}+1/2 [v,\bar{u},\bar{w}]$	(12) $\bar{y},x,\bar{z}+1/2 [\bar{v},u,\bar{w}]$
	(13) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(14) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(15) $\bar{y},\bar{x},z+1/2 [\bar{v},\bar{u},w]$	(16) $y,x,z+1/2 [v,u,w]$
8 h .m.	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$	$\bar{y},0,z+1/2 [0,\bar{u},0]$	$y,0,z+1/2 [0,u,0]$
	$0,y,\bar{z} [\bar{u},0,0]$	$0,\bar{y},\bar{z} [u,0,0]$	$y,0,\bar{z}+1/2 [0,\bar{u},0]$	$\bar{y},0,\bar{z}+1/2 [0,u,0]$
8 g m..	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{y},x,1/2 [0,0,\bar{w}]$	$y,\bar{x},1/2 [0,0,\bar{w}]$
	$\bar{x},y,0 [0,0,\bar{w}]$	$x,\bar{y},0 [0,0,\bar{w}]$	$y,x,1/2 [0,0,w]$	$\bar{y},\bar{x},1/2 [0,0,w]$
8 f ..2'	$x,x,1/4 [u,\bar{u},w]$	$\bar{x},\bar{x},1/4 [\bar{u},u,w]$	$\bar{x},x,3/4 [\bar{u},\bar{u},\bar{w}]$	$x,\bar{x},3/4 [u,u,\bar{w}]$
	$\bar{x},\bar{x},3/4 [u,\bar{u},w]$	$x,x,3/4 [\bar{u},u,w]$	$x,\bar{x},1/4 [\bar{u},\bar{u},\bar{w}]$	$\bar{x},x,1/4 [u,u,\bar{w}]$
4 e m2m.	$x,0,1/2 [0,0,0]$	$\bar{x},0,1/2 [0,0,0]$	$0,x,0 [0,0,0]$	$0,\bar{x},0 [0,0,0]$
4 d m2m.	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$	$0,x,1/2 [0,0,0]$	$0,\bar{x},1/2 [0,0,0]$
4 c 2mm.	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	$0,0,z+1/2 [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$
2 b $\bar{4}'m2'$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$		
2 a mmm.	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$		

Continued

No. 41.8.224

$p4_2'/mmc'$

Symmetry of special projections

Along [001] $4'mm'$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

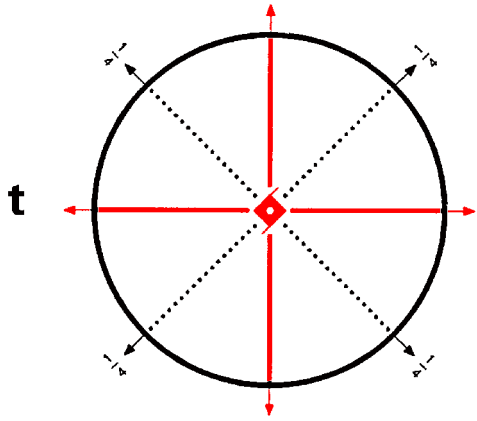
Along [110] $p2'mm'$

$a^* = c/2$

Origin at x,x,0

$p4_2'/mm'c$

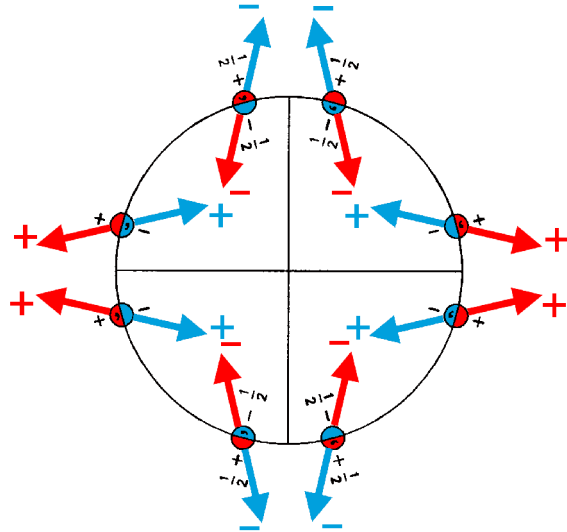
No. 41.9.225



$4'/mm'm$

$p4_2'/m2'/m'2'/c$

Tetragonal



Origin at center ($m'm'm$) at $4_2'/m2'/m'c$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ (0,0,1/2) 0,0,z
(4 _z 0,0,1/2)' | (4) 4 ⁻ (0,0,1/2) 0,0,z
(4 _z ⁻¹ 0,0,1/2)' |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2 x,x,1/4
(2 _{xy} 0,0,1/2) | (8) 2 x,x̄,1/4
(2 _{xy} 0,0,1/2) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,1/4
($\bar{4}$ _z 0,0,1/2)' | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,1/4
($\bar{4}$ _z ⁻¹ 0,0,1/2)' |
| (13) m' x,0,z
(m _y 0,0,0)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) c (0,0,1/2) x,x̄,z
(m _{xy} 0,0,1/2) | (16) c (0,0,1/2) x,x,z
(m _{xy} 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) $\bar{y},x,z+1/2$ [v, \bar{u},\bar{w}]	(4) $y,\bar{x},z+1/2$ [\bar{v},u,\bar{w}]
16 i 1	(5) \bar{x},y,\bar{z} [u, \bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	(7) $y,x,\bar{z}+1/2$ [v,u, \bar{w}]	(8) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y,\bar{z} [\bar{u},\bar{v},w]	(11) $y,\bar{x},\bar{z}+1/2$ [v, \bar{u},\bar{w}]	(12) $\bar{y},x,\bar{z}+1/2$ [\bar{v},u,\bar{w}]
	(13) x,\bar{y},z [u, \bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) $\bar{y},\bar{x},z+1/2$ [v,u, \bar{w}]	(16) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]
8 h m' .	$0,y,z$ [0,v,w]	$0,\bar{y},z$ [0, \bar{v},w]	$\bar{y},0,z+1/2$ [v,0, \bar{w}]	$y,0,z+1/2$ [$\bar{v},0,\bar{w}$]
	$0,y,\bar{z}$ [0, \bar{v},w]	$0,\bar{y},\bar{z}$ [0,v,w]	$y,0,\bar{z}+1/2$ [v,0, \bar{w}]	$\bar{y},0,\bar{z}+1/2$ [$\bar{v},0,\bar{w}$]
8 g $m..$	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,1/2$ [0,0, \bar{w}]	$y,\bar{x},1/2$ [0,0, \bar{w}]
	$\bar{x},y,0$ [0,0,w]	$x,\bar{y},0$ [0,0,w]	$y,x,1/2$ [0,0, \bar{w}]	$\bar{y},\bar{x},1/2$ [0,0, \bar{w}]
8 f $.2$	$x,x,1/4$ [u,u,0]	$\bar{x},\bar{x},1/4$ [$\bar{u},\bar{u},0$]	$\bar{x},x,3/4$ [u, $\bar{u},0$]	$x,\bar{x},3/4$ [$\bar{u},u,0$]
	$\bar{x},\bar{x},3/4$ [u,u,0]	$x,x,3/4$ [$\bar{u},\bar{u},0$]	$x,\bar{x},1/4$ [u, $\bar{u},0$]	$\bar{x},x,1/4$ [$\bar{u},u,0$]
4 e $m2'm'$.	$x,0,1/2$ [0,0,w]	$\bar{x},0,1/2$ [0,0,w]	$0,x,0$ [0,0, \bar{w}]	$0,\bar{x},0$ [0,0, \bar{w}]
4 d $m2'm'$.	$x,0,0$ [0,0,w]	$\bar{x},0,0$ [0,0,w]	$0,x,1/2$ [0,0, \bar{w}]	$0,\bar{x},1/2$ [0,0, \bar{w}]
4 c $2m'm'$.	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	$0,0,z+1/2$ [0,0, \bar{w}]	$0,0,\bar{z}+1/2$ [0,0, \bar{w}]
2 b $\bar{4}'m'2$	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]		
2 a $mm'm'$.	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0, \bar{w}]		

Continued

No. 41.9.225

$p4_2'/mm'c$

Symmetry of special projections

Along [001] $4mm1'$

Origin at 0,0,z

Along [100] $p2'mm'$

$a^* = c$

Origin at x,0,0

Along [110] $p_{2a^*}2'mm'$

$a^* = c/2$

Origin at x,x,0

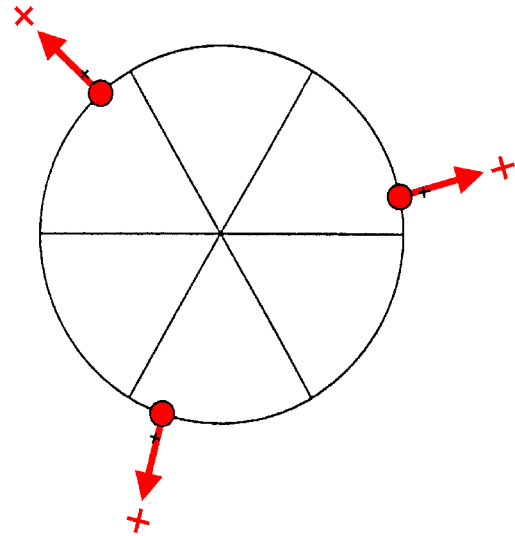
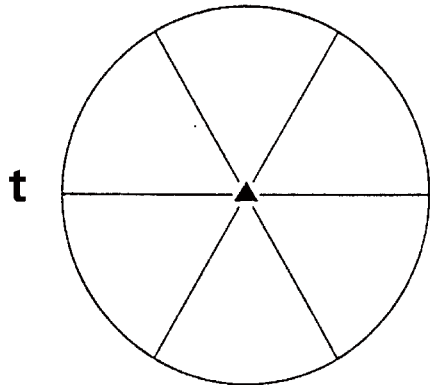
$p3$

3

Trigonal

No. 42.1.226

$p3$



Origin on 3

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

Generators selected (1); $t(0,0,1)$; (2)

Positions

		Coordinates		
		Multiplicity, Wyckoff letter, Site symmetry		
3	b 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
1	a 3..	$0,0,z$ [$0,0,w$]		

Symmetry of special projections

Along [001] 3	Along [100] $p1$ $a^* = c$	Along [210] $p1$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

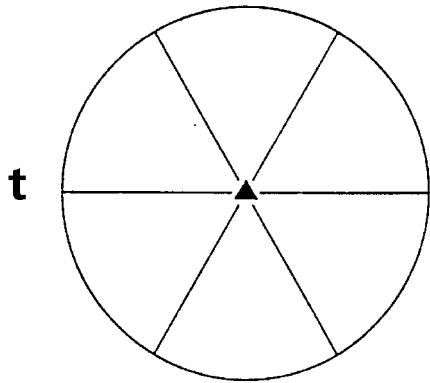
$p31'$

$31'$

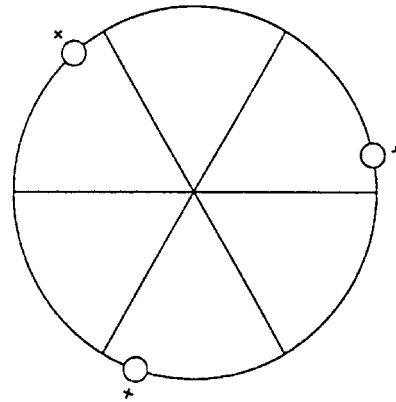
Trigonal

No. 42.2.227

$p31'$



1'



Origin on $31'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

(1) 1

$(1|0,0,0)$

(2) 3^+ $0,0,z$

$(3_z|0,0,0)$

(3) 3^- $0,0,z$

$(3_z^{-1}|0,0,0)$

For $1' +$ set

(1) $1'$

$(1|0,0,0)'$

(2) $3^{+'}$ $0,0,z$

$(3_z|0,0,0)'$

(3) $3^{-'}$ $0,0,z$

$(3_z^{-1}|0,0,0)'$

Generators selected (1); $t(0,0,1)$; (2); $1'$

Positions

		Coordinates		
Multiplicity, Wyckoff letter, Site symmetry				
		1+	1' +	
3	b 11'	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
1	a 3..1'	0,0,z [0,0,0]		

Symmetry of special projections

Along [001] $31'$	Along [100] $p11'$	Along [210] $p11'$
	$a^* = c$	$a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

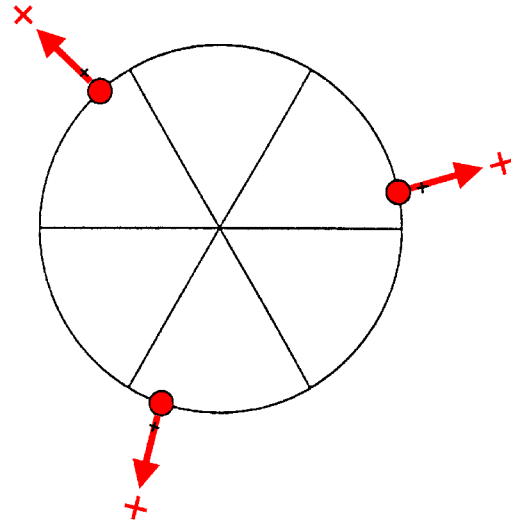
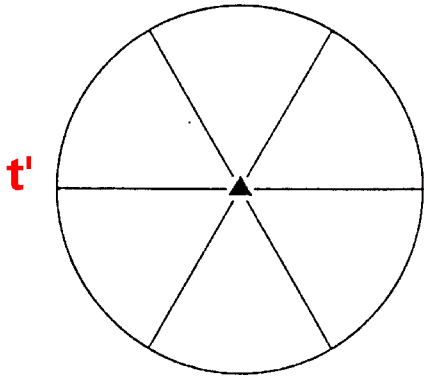
$\rho_{2c}3$

No. 42.3.228

$31'$

$\rho_{2c}3$

Trigonal



Origin on 3

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For (0,0,0) + set
 (1) 1
 (1|0,0,0)

(2) 3^+ 0,0,z
 (3_z |0,0,0)

(3) 3^- 0,0,z
 (3_z^{-1} |0,0,0)

For (0,0,1)' + set
 (1) t' (0,0,1)
 (1|0,0,1)'

(2) $3^{+'}$ (0,0,1) 0,0,z
 (3_z |0,0,1)'

(3) $3^{-'}$ (0,0,1) 0,0,z
 (3_z^{-1} |0,0,1)'

Generators selected (1); $t(0,0,1)'$; (2)

Positions

		Coordinates		
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)'+	
3	b 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
1	a 3..	0,0,z [0,0,w]		

Symmetry of special projections

Along [001] $31'$	Along [100] $p_{2a^*}1$ $a^* = c$	Along [210] $p_{2a^*}1$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

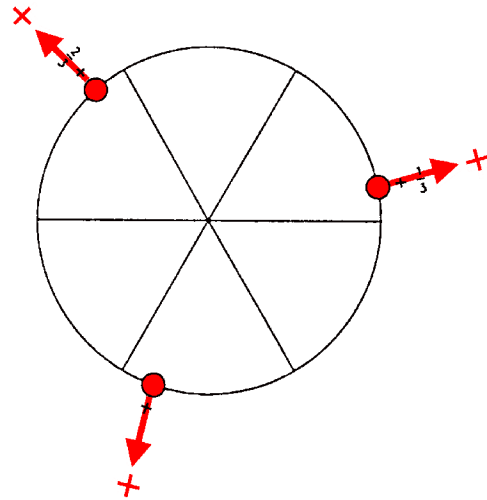
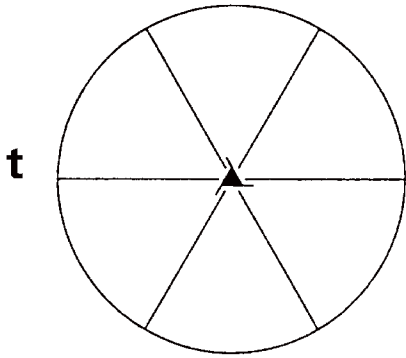
$p3_1$

No. 43.1.229

3

$p3_1$

Trigonal



Origin on 3_1

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,1/3) 0,0,z
(3_z |0,0,1/3)

(3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} |0,0,2/3)

Continued

No. 43.1.229

$p3_1$

Generators selected (1); $t(0,0,1)$; (2)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
3 a 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]

Symmetry of special projections

Along [001] 3	Along [100] $p1$ $a^* = c$	Along [210] $p1$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

$p3_11'$

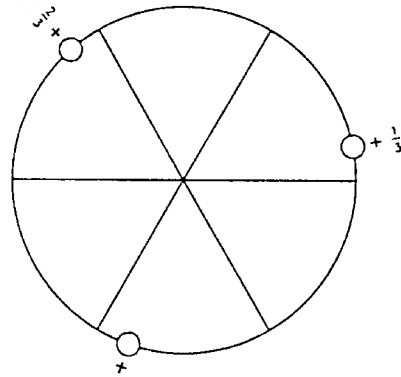
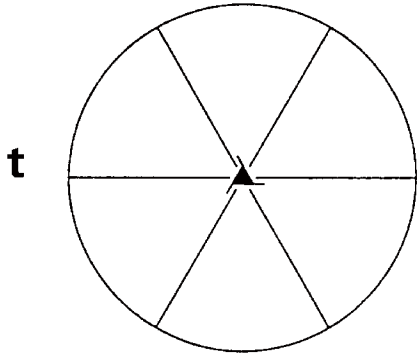
No. 43.2.230

$31'$

$p3_11'$

Trigonal

1'



Origin on $31'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

(1) 1
($1|0,0,0$)

(2) 3^+ ($0,0,1/3$) $0,0,z$
($3_z|0,0,1/3$)

(3) 3^- ($0,0,2/3$) $0,0,z$
($3_z^{-1}|0,0,2/3$)

For $1' +$ set

(1) $1'$
($1|0,0,0$)'

(2) $3^{+'}$ ($0,0,1/3$) $0,0,z$
($3_z|0,0,1/3$)'

(3) $3^{-'}$ ($0,0,2/3$) $0,0,z$
($3_z^{-1}|0,0,2/3$)'

Continued

No. 43.2.230

$p3_11'$

Generators selected (1); $t(0,0,1)$; (2); $1'$

Positions

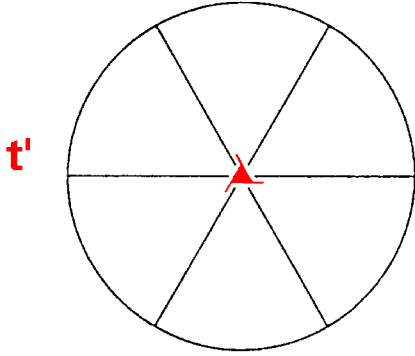
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1' +
3 a $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z+1/3$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+2/3$ [0,0,0]

Symmetry of special projections

Along [001] $31'$	Along [100] $p11'$	Along [210] $p11'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

$\rho_{2c}3_2$

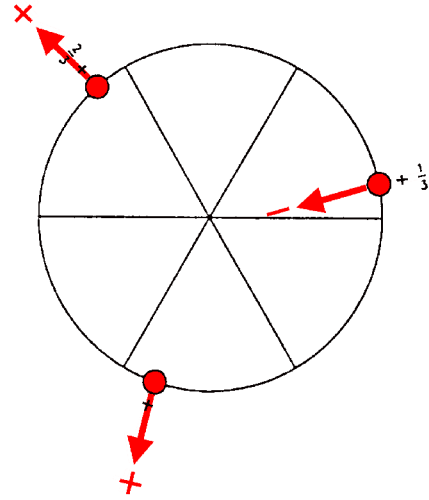
No. 43.3.231



$3_1'$

$\rho_{2c}3_2$

Trigonal



Origin on $3_1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0) +$ set

(1) 1

(1|0,0,0)

(2) 3^{+} (0,0,1/3) 0,0,z
(3_z^{-1} |0,0,1/3)'

(3) 3^{-} (0,0,2/3) 0,0,z
(3_z^{-1} |0,0,2/3)

For $(0,0,0)' +$ set

(1) t' (0,0,1)

(1|0,0,1)'

(2) 3^{+} (0,0,4/3) 0,0,z
(3_z^{-1} |0,0,4/3)

(3) 3^{-} (0,0,5/3) 0,0,z
(3_z^{-1} |0,0,5/3)'

Continued

No. 43.3.231

$P_{2c} 3_2$

Generators selected (1); $t(0,0,1)'$; (2)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(0,0,0)+	(0,0,1)' +	
3 a 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z+1/3 [v,\bar{u}+v,\bar{w}]$	(3) $\bar{x}+y,\bar{x},z+2/3 [\bar{u}+v,\bar{u},w]$

Symmetry of special projections

Along [001] $31'$	Along [100] $P_{2a^*}1$ $a^* = c$	Along [210] $P_{2a^*}1$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

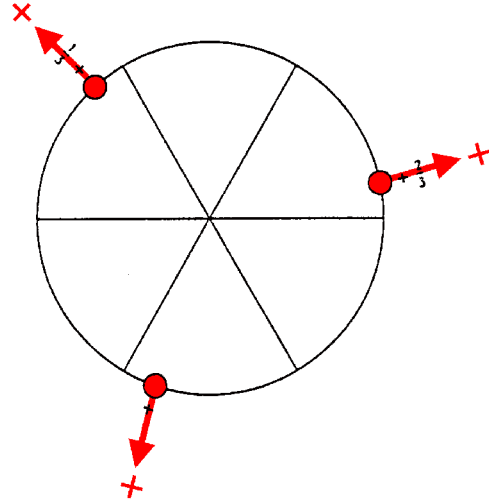
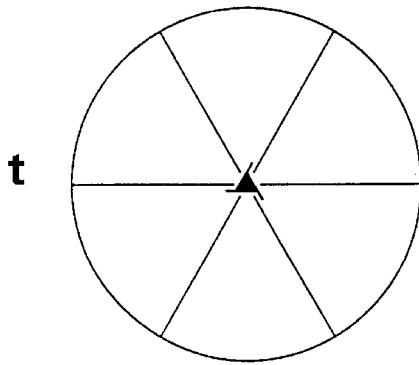
$p3_2$

3

Trigonal

No. 44.1.232

$p3_2$



Origin on 3_2

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,2/3) 0,0,z
 $(3_2|0,0,2/3)$

(3) 3^- (0,0,1/3) 0,0,z
 $(3_2^{-1}|0,0,1/3)$

Continued

No. 44.1.232

$\rho 3_2$

Generators selected (1); $t(0,0,1)$; (2)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
3 a 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [$\bar{u}+v,\bar{u},w$]

Symmetry of special projections

Along [001] 3	Along [100] $\rho 1$ $a^* = c$	Along [210] $\rho 1$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

$p3_21'$

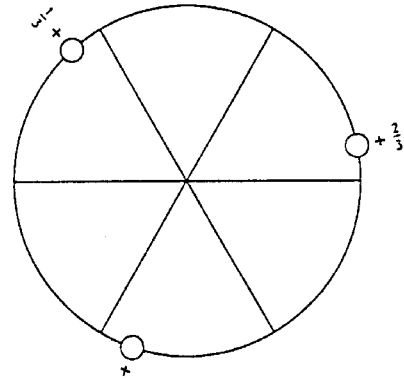
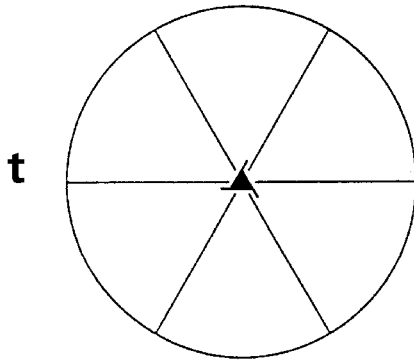
No. 44.2.233

$31'$

$p3_21'$

Trigonal

1'



Origin on $3_21'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $1 +$ set

(1) 1
($1|0,0,0$)

(2) 3^+ ($0,0,2/3$) $0,0,z$
($3_z|0,0,2/3$)

(3) 3^- ($0,0,1/3$) $0,0,z$
($3_z^{-1}|0,0,1/3$)

For $1' +$ set

(1) $1'$
($1|0,0,0$)'

(2) $3^{+'}$ ($0,0,2/3$) $0,0,z$
($3_z|0,0,2/3$)'

(3) $3^{-'}$ ($0,0,1/3$) $0,0,z$
($3_z^{-1}|0,0,1/3$)'

Continued

No. 44.2.233

$p3_21'$

Generators selected (1); $t(0,0,1)$; (2); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1' +
3 a 11'	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z+2/3$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+1/3$ [0,0,0]

Symmetry of special projections

Along [001] $31'$	Along [100] $p11'$	Along [210] $p11'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

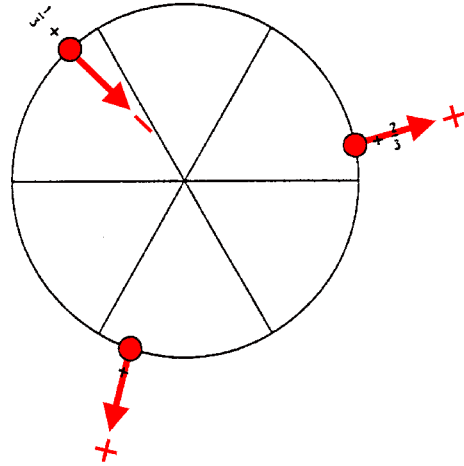
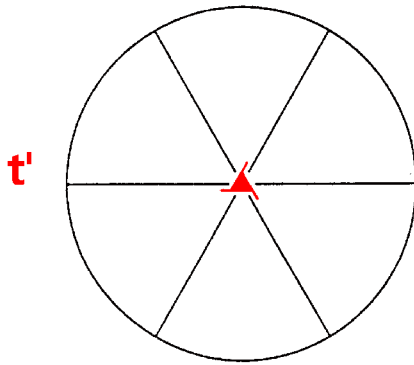
$\rho_{2c}3_1$

$31'$

Trigonal

No. 44.3.234

$\rho_{2c}3_1$



Origin on $3_2'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1

$(1|0,0,0)$

(2) $3^+ (0,0,2/3) \ 0,0,z$

$(3_2|0,0,2/3)$

(3) $3^- (0,0,1/3) \ 0,0,z$

$(3_2^{-1}|0,0,1/3)'$

For $(0,0,1)$ + set

(1) $t' (0,0,1)$

$(1|0,0,1)'$

(2) $3^{+'} (0,0,5/3) \ 0,0,z$

$(3_2|0,0,5/3)'$

(3) $3^- (0,0,4/3) \ 0,0,z$

$(3_2^{-1}|0,0,4/3)$

Continued

No. 44.3.234

$\rho_{2c} 3_1$

Generators selected (1); $t(0,0,1)'$; (2)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
3 a 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z+2/3 [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z+1/3 [u-v,u,\bar{w}]$

Symmetry of special projections

Along [001] $31'$	Along [100] $\rho_{2a^*} 1$ $a^* = c$	Along [210] $\rho_{2a^*} 1$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

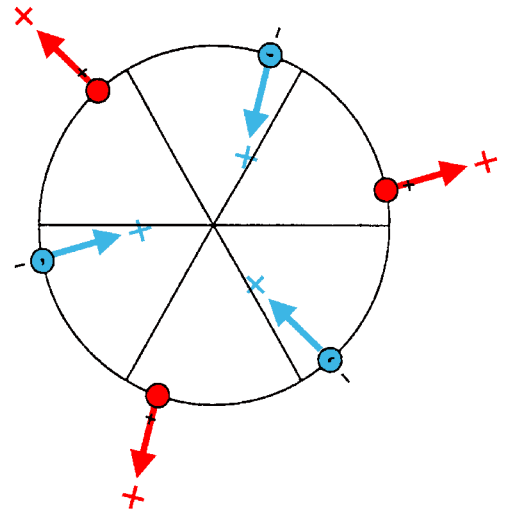
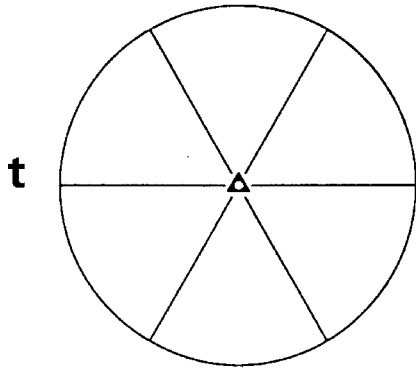
$p\bar{3}$

No. 45.1.235

$\bar{3}$

$p\bar{3}$

Trigonal



Origin at center ($\bar{3}$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(5) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ |0,0,0)

(6) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ |0,0,0)

Continued

No. 45.1.235

 $p\bar{3}$ Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

		Coordinates		
Multiplicity, Wyckoff letter, Site symmetry				
6	d 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
		(4) \bar{x},\bar{y},\bar{z} [u,v,w]	(5) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(6) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]
2	c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]	
1	b $\bar{3}$..	$0,0,1/2$ [$0,0,w$]		
1	a $\bar{3}$..	$0,0,0$ [$0,0,w$]		

Symmetry of special projections

Along [001] $6'$	Along [100] $p2'11$	Along [210] $p2'11$
	$a^* = c$	$a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

$p\bar{3}1'$

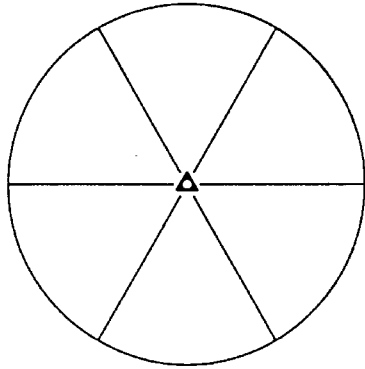
No. 45.2.236

$\bar{3}1'$

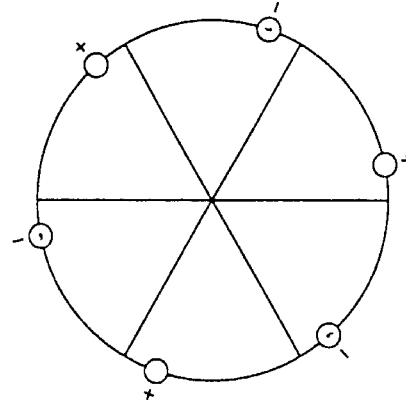
$p\bar{3}1'$

Trigonal

t



1'



Origin at center ($\bar{3}1'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

(1) 1
($1|0,0,0$)

(2) 3^+ $0,0,z$
($3_z|0,0,0$)

(3) 3^- $0,0,z$
($3_z^{-1}|0,0,0$)

(4) $\bar{1}$ $0,0,0$
($\bar{1}|0,0,0$)

(5) $\bar{3}^+$ $0,0,z; 0,0,0$
($\bar{3}_z|0,0,0$)

(6) $\bar{3}^-$ $0,0,z; 0,0,0$
($\bar{3}_z^{-1}|0,0,0$)

For $1' +$ set

(1) $1'$
($1|0,0,0$)'

(2) $3^{+'}$ $0,0,z$
($3_z|0,0,0$)'

(3) $3^{-'}$ $0,0,z$
($3_z^{-1}|0,0,0$)'

(4) $\bar{1}'$ $0,0,0$
($\bar{1}|0,0,0$)'

(5) $\bar{3}^{+'}$ $0,0,z; 0,0,0$
($\bar{3}_z|0,0,0$)'

(6) $\bar{3}^{-'}$ $0,0,z; 0,0,0$
($\bar{3}_z^{-1}|0,0,0$)'

Continued

No. 45.2.236

 $p\bar{3}1'$ Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1'+
6 d $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) \bar{x},\bar{y},\bar{z} [0,0,0]	(5) $y,\bar{x}+y,\bar{z}$ [0,0,0]	(6) $x-y,x,\bar{z}$ [0,0,0]
2 c $3..1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
1 b $\bar{3}..1'$	$0,0,1/2$ [0,0,0]		
1 a $\bar{3}..1'$	$0,0,0$ [0,0,0]		

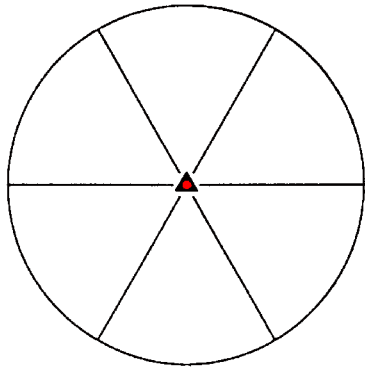
Symmetry of special projections

Along [001] $61'$	Along [100] $p2111'$	Along [210] $p2111'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

$p\bar{3}'$

No. 45.3.237

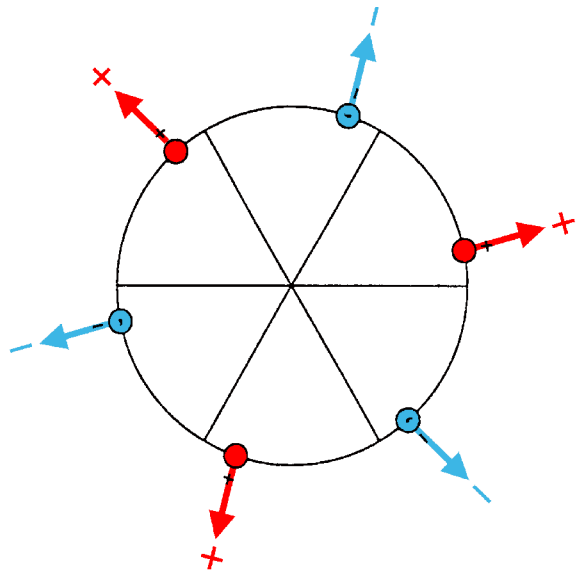
t



$\bar{3}'$

$p\bar{3}'$

Trigonal



Origin at center ($\bar{3}'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) $\bar{1}'$ 0,0,0
($\bar{1}$ |0,0,0)

(5) $\bar{3}^{+ '}$ 0,0,z; 0,0,0
($\bar{3}_z$ |0,0,0)

(6) $\bar{3}^{- '}$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ |0,0,0)

Continued

No. 45.3.237

 $p\bar{3}'$ Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 d 1	(4) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(5) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(6) $x-y,x,\bar{z}$ [$u-v,u,\bar{w}$]
2 c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	
1 b $\bar{3}'..$	$0,0,1/2$ [$0,0,0$]		
1 a $\bar{3}'..$	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

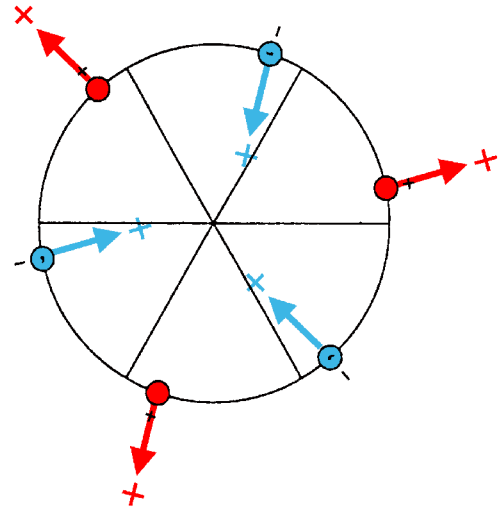
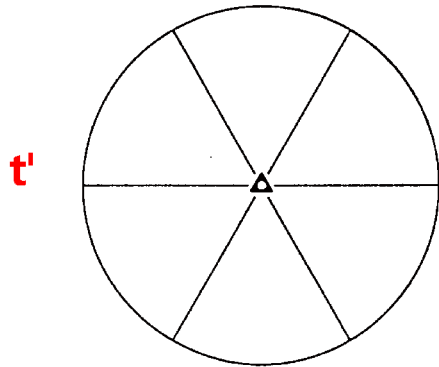
Along [001] 6	Along [100] $p211$ $a^* = c$	Along [210] $p211$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

$\rho_{2c}\bar{3}$

No. 45.4.238

 $\bar{3}1'$ $\rho_{2c}\bar{3}$

Trigonal

Origin at center ($\bar{3}$)Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (5) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (6) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| For (0,0,1)' + set | | |
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) $\bar{1}$ ' 0,0,1/2
($\bar{1}$ 0,0,1)' | (5) $\bar{3}^{+'}$ 0,0,z; 0,0,1/2
($\bar{3}_z$ 0,0,1)' | (6) $\bar{3}^{-'}$ 0,0,z; 0,0,1/2
($\bar{3}_z^{-1}$ 0,0,1)' |

Continued

No. 45.4.238

 $p_{2c} \bar{3}$ Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
6 d 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},\bar{z} [u,v,w]	(5) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(6) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]
2 c 3..	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]	
1 b $\bar{3}'..$	0,0,1/2 [0,0,0]		
1 a $\bar{3}..$	0,0,0 [0,0,w]		

Symmetry of special projections

Along [001] $61'$	Along [100] $p_{2a^*} 2'11$ $a^* = c$	Along [210] $p_{2a^*} 2'11$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

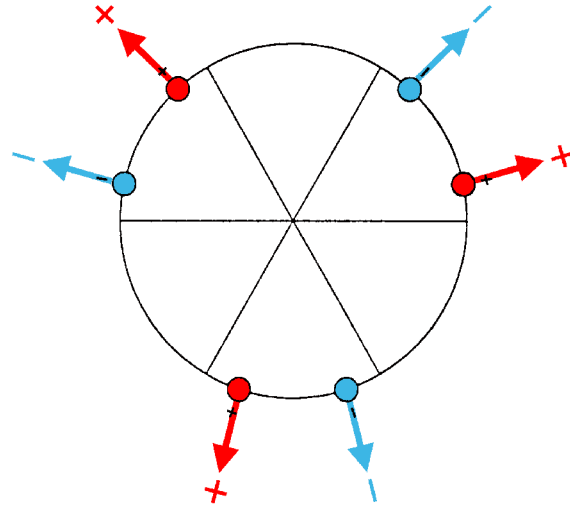
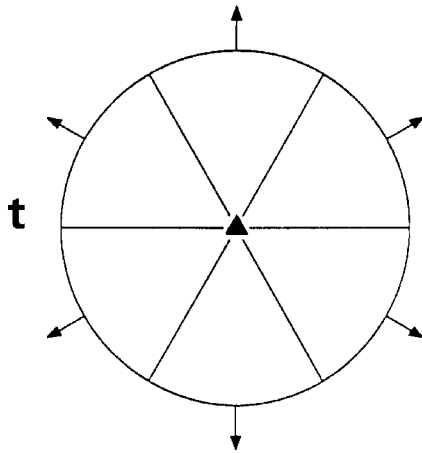
p312

312

Trigonal

No. 46.1.239

p312



Origin at 312

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) 2 $x, \bar{x}, 0$
(2_3 |0,0,0)

(5) 2 $x, 2x, 0$
(2_2 |0,0,0)

(6) 2 $2x, x, 0$
(2_1 |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 f 1	(4) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(5) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(6) $x,x-y,\bar{z}$ [$u,u-v,\bar{w}$]
3 e ..2	$x,\bar{x},1/2$ [$u,\bar{u},0$]	$x,2x,1/2$ [$u,2u,0$]	$2\bar{x},\bar{x},1/2$ [$2\bar{u},\bar{u},0$]
3 d ..2	$x,\bar{x},0$ [$u,\bar{u},0$]	$x,2x,0$ [$u,2u,0$]	$2\bar{x},\bar{x},0$ [$2\bar{u},\bar{u},0$]
2 c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	
1 b 3.2	$0,0,1/2$ [$0,0,0$]		
1 a 3.2	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $3m'$	Along [100] $p1m'1$	Along [210] $p211$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

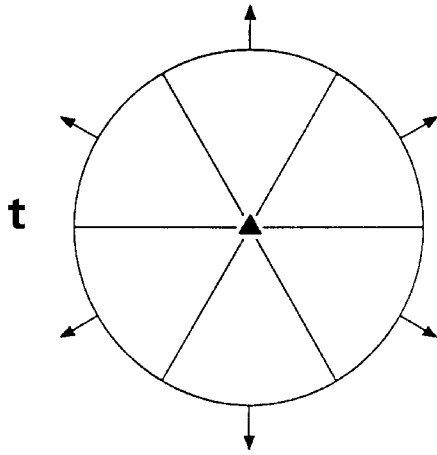
$p3121'$

$3121'$

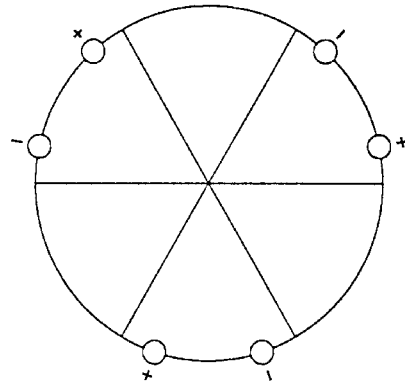
Trigonal

No. 46.2.240

$p3121'$



1'



Origin at $3121'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

- | | | |
|--|--------------------------------------|---|
| (1) 1
($1 0,0,0$) | (2) 3^+ $0,0,z$
($3_z 0,0,0$) | (3) 3^- $0,0,z$
($3_z^{-1} 0,0,0$) |
| (4) 2 $x,\bar{x},0$
($2_3 0,0,0$) | (5) 2 $x,2x,0$
($2_2 0,0,0$) | (6) 2 $2x,x,0$
($2_1 0,0,0$) |

For $1' +$ set

- | | | |
|--|---|--|
| (1) $1'$
($1 0,0,0$)' | (2) $3^{+ '}$ $0,0,z$
($3_z 0,0,0$)' | (3) $3^{- '}$ $0,0,z$
($3_z^{-1} 0,0,0$)' |
| (4) $2'$ $x,\bar{x},0$
($2_3 0,0,0$)' | (5) $2'$ $x,2x,0$
($2_2 0,0,0$)' | (6) $2'$ $2x,x,0$
($2_1 0,0,0$)' |

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$1+$	$1' +$
6 f $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $\bar{y},\bar{x},\bar{z} [0,0,0]$	(5) $\bar{x}+y,y,\bar{z} [0,0,0]$	(6) $x,x-y,\bar{z} [0,0,0]$
3 e $..21'$	$x,\bar{x},1/2 [0,0,0]$	$x,2x,1/2 [0,0,0]$	$2\bar{x},\bar{x},1/2 [0,0,0]$
3 d $..21'$	$x,\bar{x},0 [0,0,0]$	$x,2x,0 [0,0,0]$	$2\bar{x},\bar{x},0 [0,0,0]$
2 c $3..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 b $3.21'$	$0,0,1/2 [0,0,0]$		
1 a $3.21'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $3m1'$	Along [100] $p1m11'$	Along [210] $p2111'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

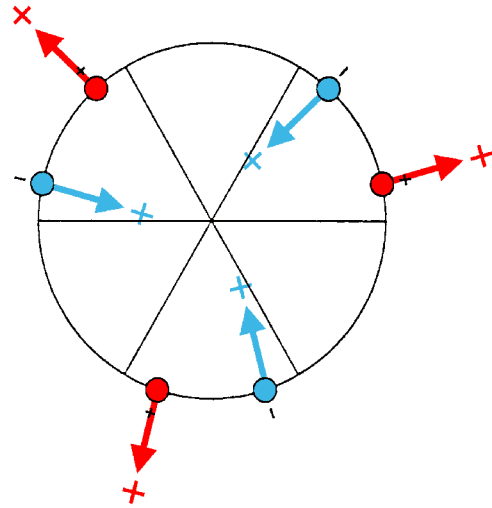
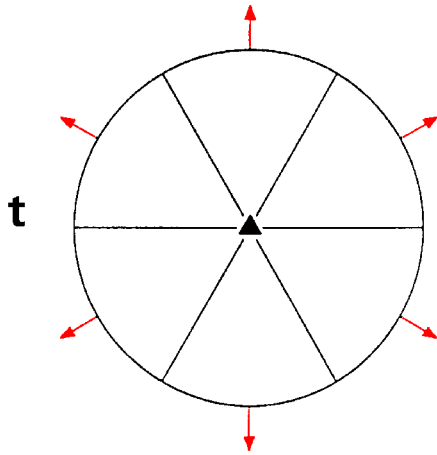
$p312'$

No. 46.3.241

$312'$

$p312'$

Trigonal



Origin at $312'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) $2'$ x, \bar{x} ,0
(2_3 |0,0,0)'

(5) $2'$ x,2x,0
(2_2 |0,0,0)'

(6) $2'$ 2x,x,0
(2_1 |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 f 1	(4) \bar{y},\bar{x},\bar{z} [v,u,w]	(5) $\bar{x}+y,y,\bar{z}$ [u-v, \bar{v},w]	(6) $x,x-y,\bar{z}$ [$\bar{u},\bar{u}+v,w$]
3 e ..2'	$x,\bar{x},1/2$ [u,u,w]	$x,2x,1/2$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/2$ [0, \bar{u},w]
3 d ..2'	$x,\bar{x},0$ [u,u,w]	$x,2x,0$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},0$ [0, \bar{u},w]
2 c 3..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	
1 b 3.2'	$0,0,1/2$ [0,0,w]		
1 a 3.2'	$0,0,0$ [0,0,w]		

Symmetry of special projections

Along [001] 3m	Along [100] $p1m1$ $a^* = c$	Along [210] $p2'11$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

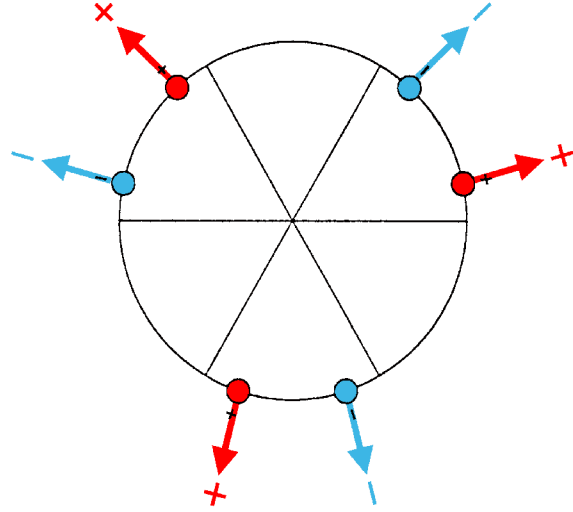
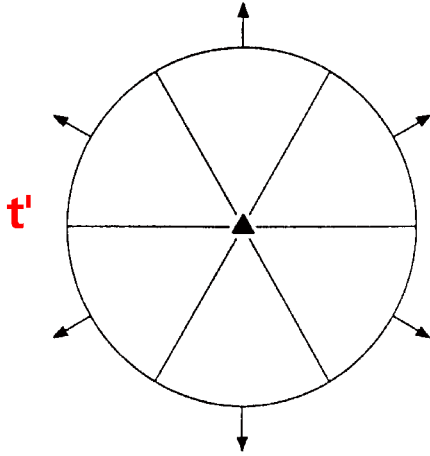
$p_{2c}312$

3121'

Trigonal

No. 46.4.242

$p_{2c}312$



Origin at 312

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | |
|--|-------------------------------------|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 $x, \bar{x}, 0$
(2_3 0,0,0) | (5) 2 $x, 2x, 0$
(2_2 0,0,0) | (6) 2 $2x, x, 0$
(2_1 0,0,0) |

For (0,0,1)' + set

- | | | |
|--|---|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+ '}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{- '}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) $2'$ $x, \bar{x}, 1/2$
(2_3 0,0,1)' | (5) $2'$ $x, 2x, 1/2$
(2_2 0,0,1)' | (6) $2'$ $2x, x, 1/2$
(2_1 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
6 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(5) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(6) $x,x-y,\bar{z}$ [u,u-v, \bar{w}]
3 e ..2'	$x,\bar{x},1/2$ [u,u,w]	$x,2x,1/2$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/2$ [0, \bar{u},w]
3 d ..2	$x,\bar{x},0$ [u, $\bar{u},0$]	$x,2x,0$ [u,2u,0]	$2\bar{x},\bar{x},0$ [2 $\bar{u},\bar{u},0$]
2 c 3..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	
1 b 3.2'	$0,0,1/2$ [0,0,w]		
1 a 3.2	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $3m'$	Along [100] $p_{2a^*} 1m'1$	Along [210] $p_{2a^*} 211$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

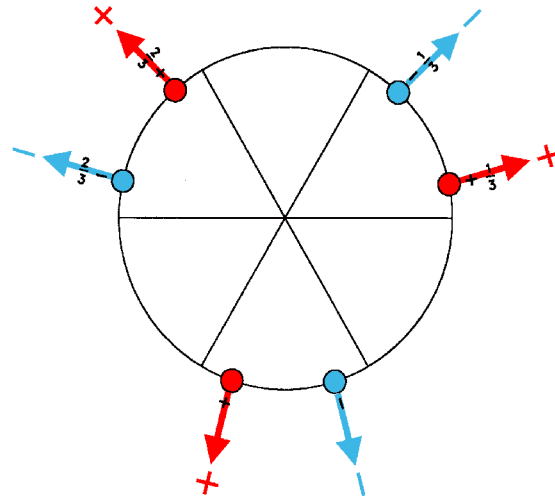
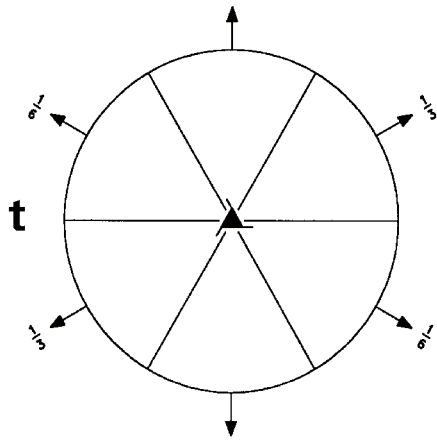
$p3_112$

312

Trigonal

No. 47.1.243

$p3_112$



Origin on $2[210]$ at $3_1(1,1,2)$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,1/3) 0,0,z
(3_2 |0,0,1/3)

(3) 3^- (0,0,2/3) 0,0,z
(3_2^{-1} |0,0,2/3)

(4) 2 x, \bar{x} ,1/3
(2_3 |0,0,2/3)

(5) 2 x,2x,1/6
(2_2 |0,0,1/3)

(6) 2 2x,x,0
(2_1 |0,0,0)

Generators selected (1); t(0,0,1); (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x, y, z [u, v, w]	(2) $\bar{y}, x-y, z+1/3$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z+2/3$ [$\bar{u}+v, \bar{u}, w$]
6 c 1	(4) $\bar{y}, \bar{x}, \bar{z}+2/3$ [$\bar{v}, \bar{u}, \bar{w}$]	(5) $\bar{x}+y, y, \bar{z}+1/3$ [$\bar{u}+v, v, \bar{w}$]	(6) $x, x-y, \bar{z}$ [u, u-v, \bar{w}]
3 b ..2	$x, \bar{x}, 5/6$ [u, $\bar{u}, 0$]	$x, 2x, 1/6$ [u, 2u, 0]	$2\bar{x}, \bar{x}, 1/2$ [2 $\bar{u}, \bar{u}, 0$]
3 a ..2	$x, \bar{x}, 1/3$ [u, $\bar{u}, 0$]	$x, 2x, 2/3$ [u, 2u, 0]	$2\bar{x}, \bar{x}, 0$ [2 $\bar{u}, \bar{u}, 0$]

Symmetry of special projections

Along [001] 3m'	Along [100] $p1m'1$ $a^* = c$	Along [210] $p211$ $a^* = c$
Origin at 0,0,z	Origin at x,0,1/6	Origin at x,x/2,0

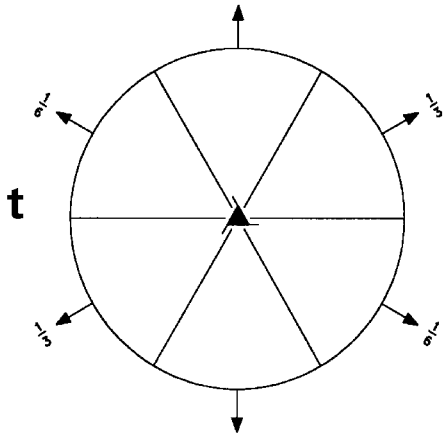
$p3_1121'$

$3121'$

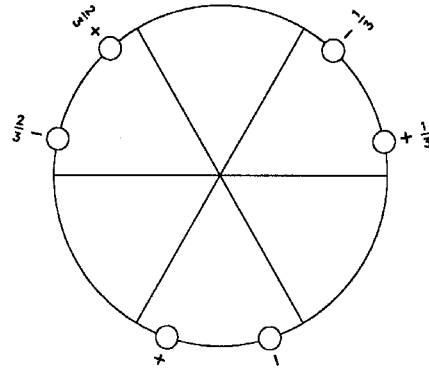
Trigonal

No. 47.2.244

$p3_1121'$



1'



Origin on $21'[210]$ at $3_11(1,1,2)1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

(1) 1
($1|0,0,0$)

(2) $3^+ (0,0,1/3) \ 0,0,z$
($3_z|0,0,1/3$)

(3) $3^- (0,0,2/3) \ 0,0,z$
($3_z^{-1}|0,0,2/3$)

(4) $2 \ x,\bar{x},1/3$
($2_3|0,0,2/3$)

(5) $2 \ x,2x,1/6$
($2_2|0,0,1/3$)

(6) $2 \ 2x,x,0$
($2_1|0,0,0$)

For $1' +$ set

(1) $1'$
($1|0,0,0$)'

(2) $3^{+'} (0,0,1/3) \ 0,0,z$
($3_z|0,0,1/3$)'

(3) $3^{-'} (0,0,2/3) \ 0,0,z$
($3_z^{-1}|0,0,2/3$)'

(4) $2'$ $x,\bar{x},1/3$
($2_3|0,0,2/3$)'

(5) $2'$ $x,2x,1/6$
($2_2|0,0,1/3$)'

(6) $2'$ $2x,x,0$
($2_1|0,0,0$)'

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$1+$	$1'+$
6 c $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z+1/3$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+2/3$ [0,0,0]
	(4) $\bar{y},\bar{x},\bar{z}+2/3$ [0,0,0]	(5) $\bar{x}+y,y,\bar{z}+1/3$ [0,0,0]	(6) $x,x-y,\bar{z}$ [0,0,0]
3 b $..21'$	$x,\bar{x},5/6$ [0,0,0]	$x,2x,1/6$ [0,0,0]	$2\bar{x},\bar{x},1/2$ [0,0,0]
3 a $..21'$	$x,\bar{x},1/3$ [0,0,0]	$x,2x,2/3$ [0,0,0]	$2\bar{x},\bar{x},0$ [0,0,0]

Symmetry of special projections

Along [001] $3m1'$	Along [100] $p1m11'$	Along [210] $p2111'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,1/6$	$a^* = c$ Origin at $x,x/2,0$

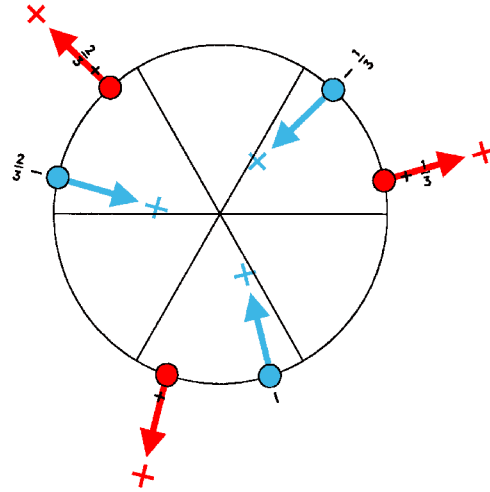
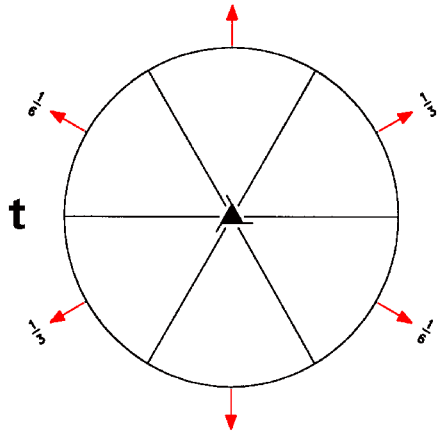
$p3_112'$

$312'$

Trigonal

No. 47.3.245

$p3_112'$



Origin on $2'[210]$ at $3_11(1,1,2')$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $3^+ (0,0,1/3) 0,0,z$
(3_2 |0,0,1/3)

(3) $3^- (0,0,2/3) 0,0,z$
(3_2^{-1} |0,0,2/3)

(4) $2' x, \bar{x}, 1/3$
(2_3 |0,0,2/3)'

(5) $2' x, 2x, 1/6$
(2_2 |0,0,1/3)'

(6) $2' 2x, x, 0$
(2_1 |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]
6 c 1	(4) $\bar{y},\bar{x},\bar{z}+2/3$ [v,u,w]	(5) $\bar{x}+y,y,\bar{z}+1/3$ [u-v, \bar{v},w]	(6) $x,x-y,\bar{z}$ [$\bar{u},\bar{u}+v,w$]
3 b ..2	$x,\bar{x},5/6$ [u,u,w]	$x,2x,1/6$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/2$ [0, \bar{u},w]
3 a ..2	$x,\bar{x},1/3$ [u,u,w]	$x,2x,2/3$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},0$ [0, \bar{u},w]

Symmetry of special projections

Along [001] $3m$ Origin at 0,0,z	Along [100] $\rho 1m1$ $a^* = c$ Origin at $x,0,1/6$	Along [210] $\rho 2'11$ $a^* = c$ Origin at $x,x/2,0$
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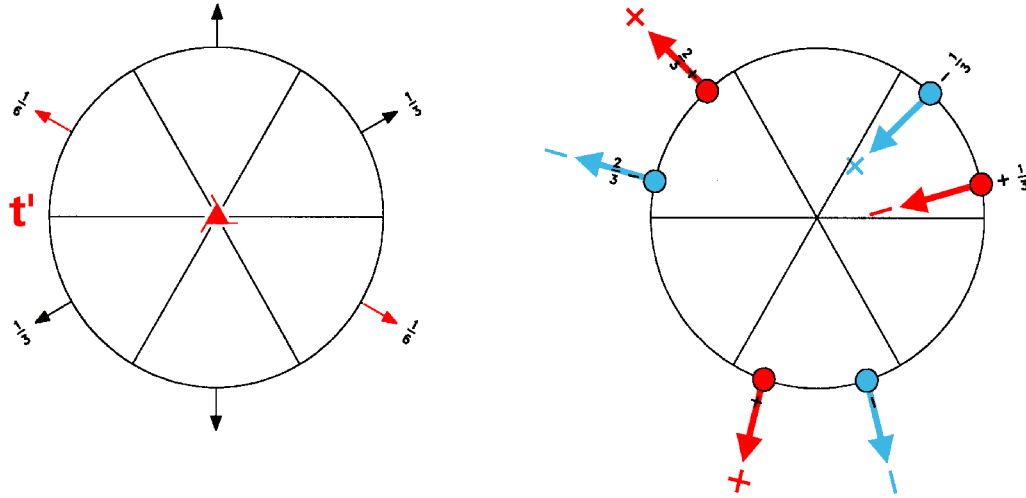
$p_{2c}3_212$

3121'

Trigonal

No. 47.4.246

$p_{2c}3_212$



Origin on $2[210]$ at $3_1'1(1,1,2)$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^{+} $(0,0,1/3)$ $0,0,z$
(3_z 0,0,1/3)' | (3) 3^{-} $(0,0,2/3)$ $0,0,z$
(3_z^{-1} 0,0,2/3) |
| (4) 2 $x, \bar{x}, 1/3$
(2_3 0,0,2/3) | (5) $2'$ $x, 2x, 1/6$
(2_2 0,0,1/3)' | (6) 2 $2x, x, 0$
(2_1 0,0,0) |

For $(0,0,1)'$ + set

- | | | |
|--|--|--|
| (1) t' $(0,0,1)$
(1 0,0,0)' | (2) 3^{+} $(0,0,4/3)$ $0,0,z$
(3_z 0,0,4/3) | (3) 3^{-} $(0,0,5/3)$ $0,0,z$
(3_z^{-1} 0,0,5/3)' |
| (4) $2'$ $x, \bar{x}, 5/6$
(2_3 0,0,5/3)' | (5) 2 $x, 2x, 2/3$
(2_2 0,0,4/3) | (6) $2'$ $2x, x, 1/2$
(2_1 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$(0,0,0)_+$	$(0,0,1)'$ +
6 c 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [v, $\bar{u}+v,\bar{w}$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{y},\bar{x},\bar{z}+2/3$ [\bar{v},\bar{u},\bar{w}]	(5) $\bar{x}+y,y,\bar{z}+1/3$ [u-v, \bar{v},w]	(6) $x,x-y,\bar{z}$ [u,u-v, \bar{w}]
3 b ..2'	$x,\bar{x},5/6$ [u,u,w]	$x,2x,1/6$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/2$ [0,u, \bar{w}]
3 a ..2	$x,\bar{x},1/3$ [u, $\bar{u},0$]	$x,2x,2/3$ [$\bar{u},2\bar{u},0$]	$2\bar{x},\bar{x},0$ [2u,u,0]

Symmetry of special projections

Along [001] $3m1'$	Along [100] $p_{2a^*} 1m'1$	Along [210] $p_{2a^*} 211$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,1/6$	$a^* = c$ Origin at $x,x/2,0$

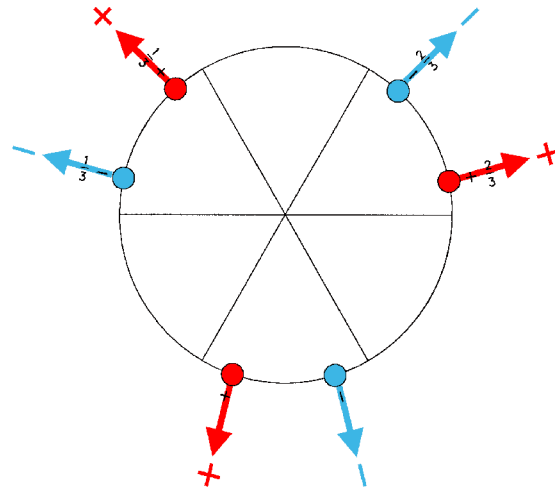
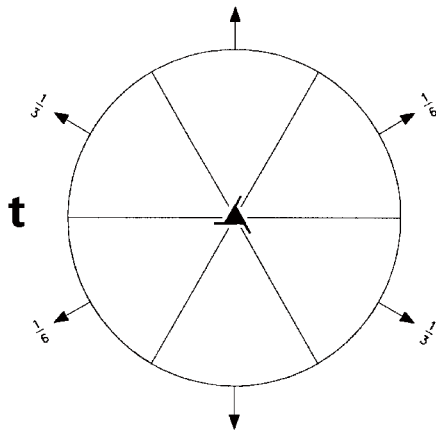
$p3_212$

312

Trigonal

No. 48.1.247

$p3_212$



Origin on $2[210]$ at $3_21(1,1,2)$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,2/3) 0,0,z
(3_2 |0,0,2/3)

(3) 3^- (0,0,1/3) 0,0,z
(3_2^{-1} |0,0,1/3)

(4) 2 $x, \bar{x}, 1/6$
(2_3 |0,0,1/3)

(5) 2 $x, 2x, 1/3$
(2_2 |0,0,2/3)

(6) 2 $2x, x, 0$
(2_1 |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [$\bar{u}+v,\bar{u},w$]
6 c 1	(4) $\bar{y},\bar{x},\bar{z}+1/3$ [\bar{v},\bar{u},\bar{w}]	(5) $\bar{x}+y,y,\bar{z}+2/3$ [$\bar{u}+v,v,\bar{w}$]	(6) $x,x-y,\bar{z}$ [$u,u-v,\bar{w}$]
3 b ..2	$x,\bar{x},1/6$ [$u,\bar{u},0$]	$x,2x,5/6$ [$u,2u,0$]	$2\bar{x},\bar{x},1/2$ [$2\bar{u},\bar{u},0$]
3 a ..2	$x,\bar{x},2/3$ [$u,\bar{u},0$]	$x,2x,1/3$ [$u,2u,0$]	$2\bar{x},\bar{x},0$ [$2\bar{u},\bar{u},0$]

Symmetry of special projections

Along [001] $3m'$ Origin at 0,0,z	Along [100] $p1m'1$ $a^* = c$ Origin at $x,0,1/3$	Along [210] $p211$ $a^* = c$ Origin at $x,x/2,0$
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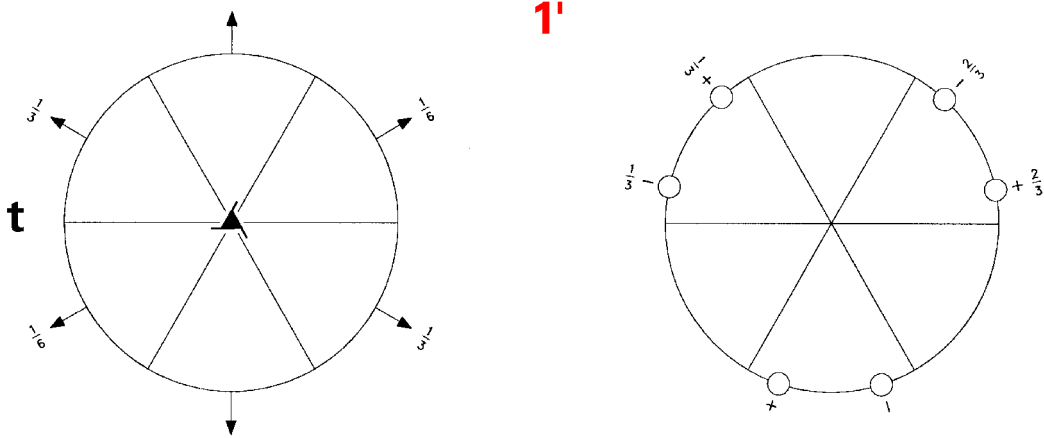
$p3_2121'$

$3121'$

Trigonal

No. 48.2.248

$p3_2121'$



Origin on $21'[210]$ at $3_21(1,1,2)1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) $3^+ (0,0,2/3) \ 0,0,z$
(3_z 0,0,2/3) | (3) $3^- (0,0,1/3) \ 0,0,z$
(3_z^{-1} 0,0,1/3) |
| (4) $2 \ x,\bar{x},1/6$
(2_3 0,0,1/3) | (5) $2 \ x,2x,1/3$
(2_2 0,0,2/3) | (6) $2 \ 2x,x,0$
(2_1 0,0,0) |

For $1' +$ set

- | | | |
|--|--|---|
| (1) $1'$
(1 0,0,0)' | (2) $3^{+'} (0,0,2/3) \ 0,0,z$
(3_z 0,0,2/3)' | (3) $3^{-'} (0,0,1/3) \ 0,0,z$
(3_z^{-1} 0,0,1/3)' |
| (4) $2'$ $x,\bar{x},1/6$
(2_3 0,0,1/3)' | (5) $2'$ $x,2x,1/3$
(2_2 0,0,2/3)' | (6) $2'$ $2x,x,0$
(2_1 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$1+$	$1'+$
6 c $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z+2/3$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+1/3$ [0,0,0]
	(4) $\bar{y},\bar{x},\bar{z}+1/3$ [0,0,0]	(5) $\bar{x}+y,y,\bar{z}+2/3$ [0,0,0]	(6) $x,x-y,\bar{z}$ [0,0,0]
3 b $..21'$	$x,\bar{x},1/6$ [0,0,0]	$x,2x,5/6$ [0,0,0]	$2\bar{x},\bar{x},1/2$ [0,0,0]
3 a $..21'$	$x,\bar{x},2/3$ [0,0,0]	$x,2x,1/3$ [0,0,0]	$2\bar{x},\bar{x},0$ [0,0,0]

Symmetry of special projections

Along [001] $3m1'$	Along [100] $p1m11'$	Along [210] $p2111'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,1/3$	$a^* = c$ Origin at $x,x/2,0$

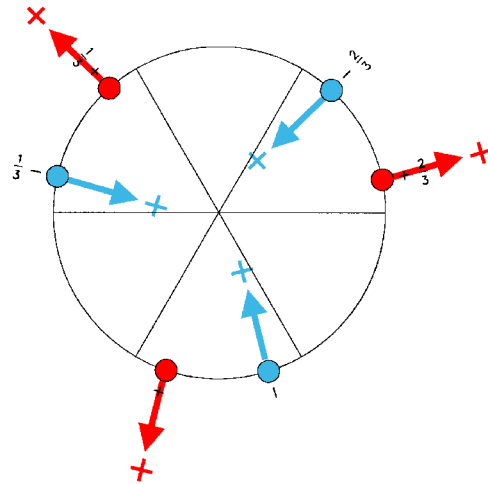
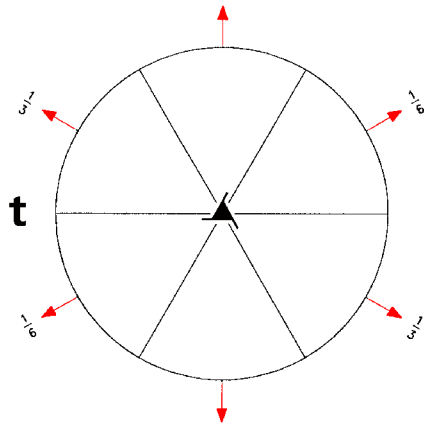
$p3_212'$

$312'$

Trigonal

No. 48.3.249

$p3_212'$



Origin on $2'[210]$ at $3_21(1,1,2')$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $3^+ (0,0,2/3) \ 0,0,z$
 $(3_2|0,0,2/3)$

(3) $3^- (0,0,1/3) \ 0,0,z$
 $(3_2^{-1}|0,0,1/3)$

(4) $2' \ x, \bar{x}, 1/6$
 $(2_3|0,0,1/3)'$

(5) $2' \ x, 2x, 1/3$
 $(2_2|0,0,2/3)'$

(6) $2' \ 2x, x, 0$
 $(2_1|0,0,0)'$

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [$\bar{u}+v,\bar{u},w$]
6 c 1	(4) $\bar{y},\bar{x},\bar{z}+1/3$ [v,u,w]	(5) $\bar{x}+y,y,\bar{z}+2/3$ [u-v, \bar{v},w]	(6) $x,x-y,\bar{z}$ [$\bar{u},\bar{u}+v,w$]
3 b ..2'	$x,\bar{x},1/6$ [u,u,w]	$x,2x,5/6$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/2$ [0, \bar{u},w]
3 a ..2'	$x,\bar{x},2/3$ [u,u,w]	$x,2x,1/3$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},0$ [0, \bar{u},w]

Symmetry of special projections

Along [001] 3m	Along [100] $\rho 1m1$ $a^* = c$	Along [210] $\rho 2'11$ $a^* = c$
Origin at 0,0,z	Origin at $x,0,1/3$	Origin at $x,x/2,0$

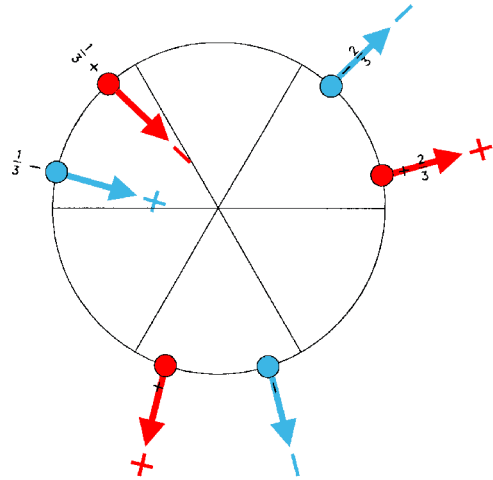
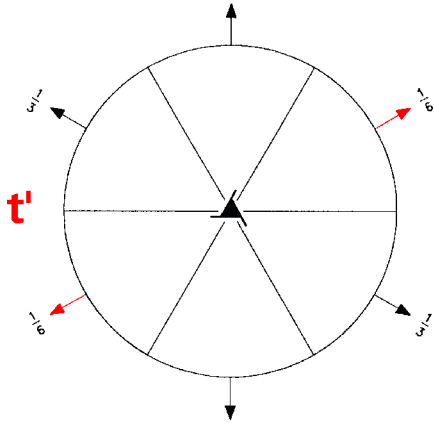
$p_{2c}3_112$

3121'

Trigonal

No. 48.4.250

$p_{2c}3_112$



Origin on $2[210]$ at $3_21(1,1,2)$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | |
|--|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,2/3) 0,0,z
(3_2 0,0,2/3) | (3) 3^- (0,0,1/3) 0,0,z
(3_2^{-1} 0,0,1/3)' |
| (4) $2'$ x, \bar{x} ,1/6
(2_3 0,0,1/3)' | (5) 2 x,2x,1/3
(2_2 0,0,2/3) | (6) 2 2x,x,0
(2_1 0,0,0) |

For $(0,0,1)'$ + set

- | | | |
|--|---|---|
| (1) t' (0,0,1)
(1 0,0,0)' | (2) 3^{+} (0,0,5/3) 0,0,z
(3_2 0,0,5/3)' | (3) 3^- (0,0,4/3) 0,0,z
(3_2^{-1} 0,0,4/3) |
| (4) 2 x, \bar{x} ,2/3
(2_3 0,0,4/3) | (5) $2'$ x,2x,5/6
(2_2 0,0,5/3)' | (6) $2'$ 2x,x,1/2
(2_1 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$(0,0,0)_+$	$(0,0,1)'$ +
6 c 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [u-v,u, \bar{w}]
	(4) $\bar{y},\bar{x},\bar{z}+1/3$ [v,u,w]	(5) $\bar{x}+y,y,\bar{z}+2/3$ [$\bar{u}+v,v,\bar{w}$]	(6) $x,x-y,\bar{z}$ [u,u-v, \bar{w}]
3 b ..2'	$x,\bar{x},1/6$ [u,u,w]	$x,2x,5/6$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/2$ [0,u, \bar{w}]
3 a ..2	$x,\bar{x},2/3$ [u, $\bar{u},0$]	$x,2x,1/3$ [$\bar{u},0,0$]	$2\bar{x},\bar{x},0$ [0, $\bar{u},0$]

Symmetry of special projections

Along [001] $3m1'$	Along [100] $p_{2a^*} 1m'1$	Along [210] $p_{2a^*} 211$
Origin at 0,0,z	$a^* = c$ Origin at x,0,1/3	$a^* = c$ Origin at x,x/2,0

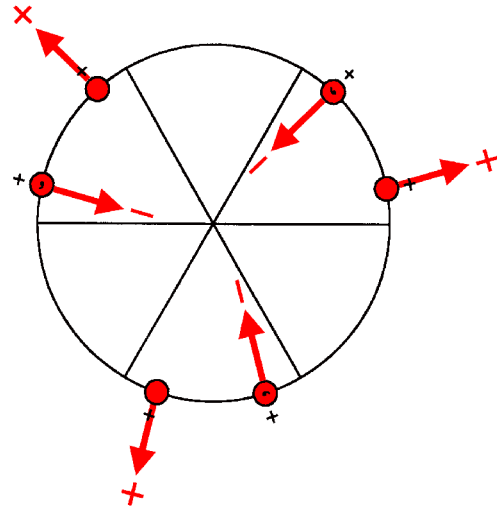
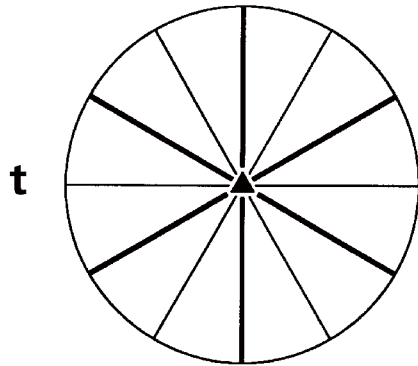
$p3m1$

No. 49.1.251

$3m1$

$p3m1$

Trigonal



Origin on $3m1$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq 2y; y \leq 2x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m x, \bar{x}, z
(m_{xy} |0,0,0)

(5) m $x, 2x, z$
(m_x |0,0,0)

(6) m $2x, x, z$
(m_y |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 c 1	(4) \bar{y},\bar{x},z [v,u,\bar{w}]	(5) $\bar{x}+y,y,z$ [$u-v,\bar{v},\bar{w}$]	(6) $x,x-y,z$ [$\bar{u},\bar{u}+v,\bar{w}$]
3 b .m.	x,\bar{x},z [$u,u,0$]	$x,2x,z$ [$\bar{u},0,0$]	$2\bar{x},\bar{x},z$ [$0,\bar{u},0$]
1 a 3m.	$0,0,z$ [$0,0,0$]		

Symmetry of special projections

Along [001] 3m	Along [100] $p11'$ $a^* = c$	Along [210] $p11m$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

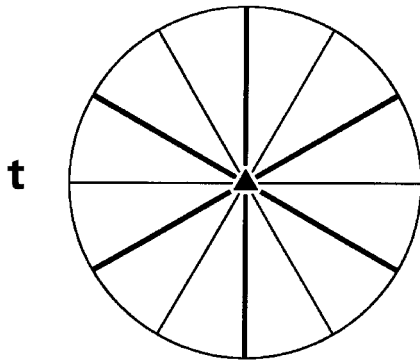
$p3m11'$

No. 49.2.252

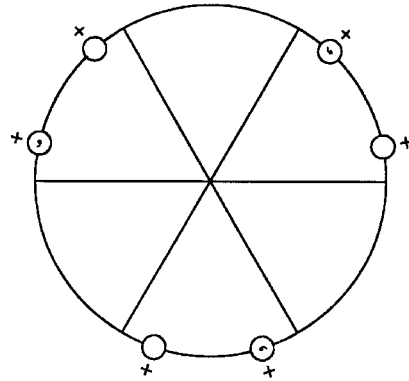
$3m11'$

$p3m11'$

Trigonal



1'



Origin on $3m11'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq 2y; y \leq 2x$

Symmetry operations

For 1 + set

(1) 1

$(1|0,0,0)$

(2) 3^+ 0,0,z

$(3_z|0,0,0)$

(3) 3^- 0,0,z

$(3_z^{-1}|0,0,0)$

(4) m x, \bar{x}, z

$(m_{xy}|0,0,0)$

(5) m $x, 2x, z$

$(m_x|0,0,0)$

(6) m $2x, x, z$

$(m_y|0,0,0)$

For 1' + set

(1) 1'

$(1|0,0,0)'$

(2) $3^{+ '}$ 0,0,z

$(3_z|0,0,0)'$

(3) $3^{- '}$ 0,0,z

$(3_z^{-1}|0,0,0)'$

(4) m' x, \bar{x}, z

$(m_{xy}|0,0,0)'$

(5) m' $x, 2x, z$

$(m_x|0,0,0)'$

(6) m' $2x, x, z$

$(m_y|0,0,0)'$

Generators selected (1); t(0,0,1); (2); (4); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
6 c 11'	(1) x,y,z [0,0,0]	(2) \bar{y} ,x-y,z [0,0,0]	(3) \bar{x} +y, \bar{x} ,z [0,0,0]
	(4) \bar{y} , \bar{x} ,z [0,0,0]	(5) \bar{x} +y,y,z [0,0,0]	(6) x,x-y,z [0,0,0]
3 b .m.1'	x, \bar{x} ,z [0,0,0]	x,2x,z [0,0,0]	2 \bar{x} , \bar{x} ,z [0,0,0]
1 a 3m.1'	0,0,z [0,0,0]		

Symmetry of special projections

Along [001] 3m1'	Along [100] p11'	Along [210] p11m1'
Origin at 0,0,z	a* = c Origin at x,0,0	a* = c Origin at x,x/2,0

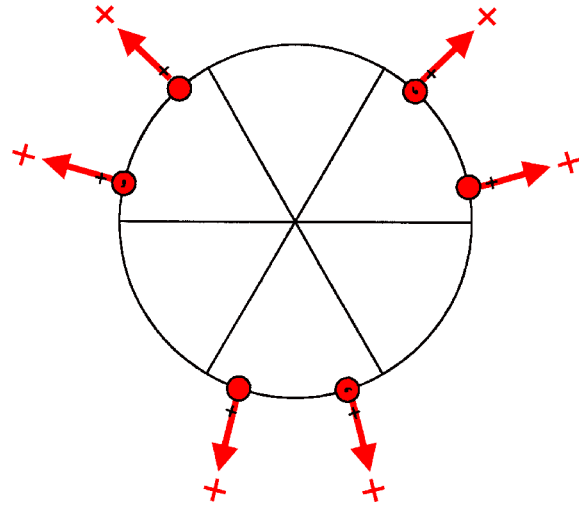
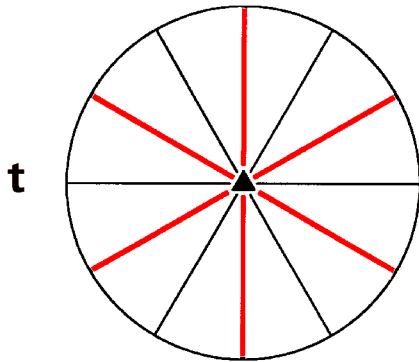
$\rho 3m'1$

No. 49.3.253

$3m'1$

$\rho 3m'1$

Trigonal



Origin on $3m'1$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq 2y; y \leq 2x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m' x, \bar{x}, z
(m_{xy} |0,0,0)'

(5) m' $x, 2x, z$
(m_x |0,0,0)'

(6) m' $2x, x, z$
(m_y |0,0,0)'

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 c 1	(4) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(5) $\bar{x}+y,y,z$ [$\bar{u}+v,v,w$]	(6) $x,x-y,z$ [$u,u-v,w$]
3 b .m'	x,\bar{x},z [u,\bar{u},w]	$x,2x,z$ [$u,2u,w$]	$2\bar{x},\bar{x},z$ [$2\bar{u},\bar{u},w$]
1 a 3m'	$0,0,z$ [$0,0,w$]		

Symmetry of special projections

Along [001] $3m'$ Origin at $0,0,z$	Along [100] $\rho 1$ $a^* = c$ Origin at $x,0,0$	Along [210] $\rho 11m'$ $a^* = c$ Origin at $x,x/2,0$

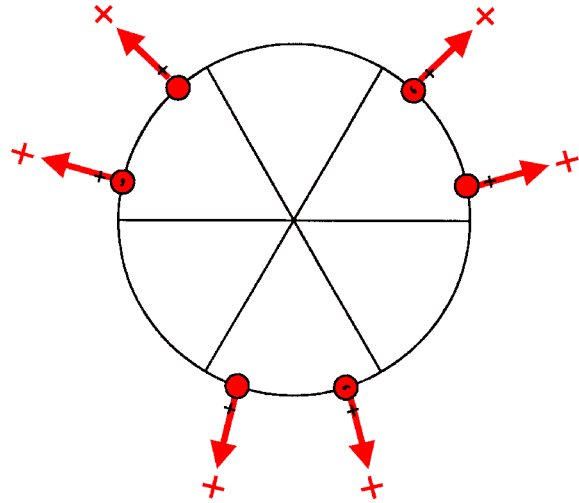
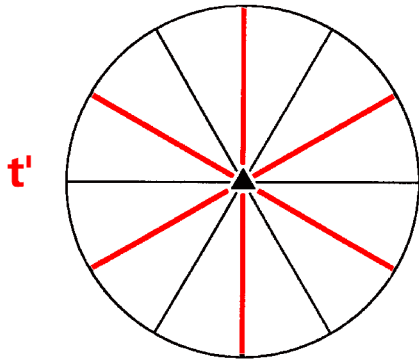
$\rho_{2c}3m'1$

$3m11'$

Trigonal

No. 49.4.254

$\rho_{2c}3m'1$



Origin on $3m'1$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq 2y; y \leq 2x$

Symmetry operations

For $(0,0,0)$ + set

(1) 1

$(1|0,0,0)$

(2) $3^+ 0,0,z$

$(3_z|0,0,0)$

(3) $3^- 0,0,z$

$(3_z^{-1}|0,0,0)$

(4) $m' x,\bar{x},z$

$(m_{xy}|0,0,0)'$

(5) $m' x,2x,z$

$(m_x|0,0,0)'$

(6) $m' 2x,x,z$

$(m_y|0,0,0)'$

For $(0,0,1)'$ + set

(1) $t' (0,0,1)$

$(1|0,0,1)'$

(2) $3^{+'} (0,0,1) 0,0,z$

$(3_z|0,0,1)'$

(3) $3^{-'} (0,0,1) 0,0,z$

$(3_z^{-1}|0,0,1)'$

(4) $c (0,0,1) x,\bar{x},z$

$(m_{xy}|0,0,1)$

(5) $c (0,0,1) x,2x,z$

$(m_x|0,0,1)$

(6) $c (0,0,1) 2x,x,z$

$(m_y|0,0,1)$

Continued

No. 49.4.254

 $p_{2c} 3m'1$ Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$(0,0,0)_+$	$(0,0,1)'$ +
6 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(5) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(6) $x,x-y,z [u,u-v,w]$
3 b $.m'$	$x,\bar{x},z [u,\bar{u},w]$	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$
1 a $3m'$	$0,0,z [0,0,w]$		

Symmetry of special projections

Along [001] $3m'1$	Along [100] $p_{2a^*} 1$ $a^* = c$	Along [210] $p_{2a^*} 11m'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

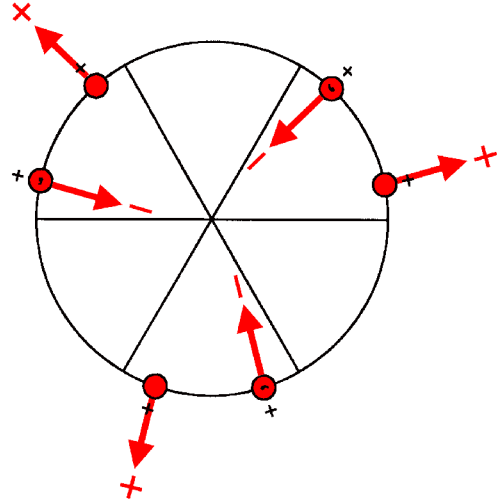
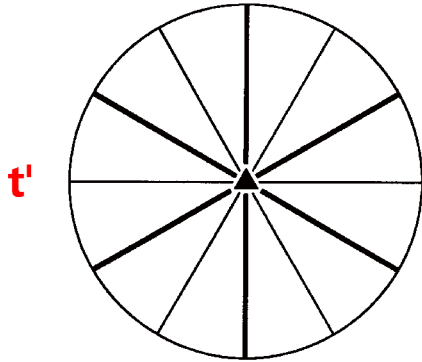
$\rho_{2c}3m1$

$3m11'$

Trigonal

No. 49.5.255

$\rho_{2c}3m1$



Origin on $3m1$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; x \leq 2y; y \leq 2x$

Symmetry operations

For $(0,0,0)$ + set

- | | | |
|---|-------------------------------------|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x, \bar{x}, z
(m_{xy} 0,0,0) | (5) m $x, 2x, z$
(m_x 0,0,0) | (6) m $2x, x, z$
(m_y 0,0,0) |

For $(0,0,1)'$ + set

- | | | |
|---|---|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+ '}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{- '}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) c' (0,0,1) x, \bar{x}, z
(m_{xy} 0,0,1)' | (5) c' (0,0,1) $x, 2x, z$
(m_x 0,0,1)' | (6) c' (0,0,1) $2x, x, z$
(m_y 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$(0,0,0)_+$	$(0,0,1)'$ +
6 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(5) $\bar{x}+y,y,z [u-v,\bar{v},\bar{w}]$	(6) $x,x-y,z [\bar{u},\bar{u}+v,\bar{w}]$
3 b .m.	$x,\bar{x},z[u,u,0]$	$x,2x,z [\bar{u},0,0]$	$2\bar{x},\bar{x},z [0,\bar{u},0]$
1 a 3m.	$0,0,z [0,0,0]$		

Symmetry of special projections

Along [001] $3m1'$	Along [100] $p11'$	Along [210] $p_{2a^*} 11m$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

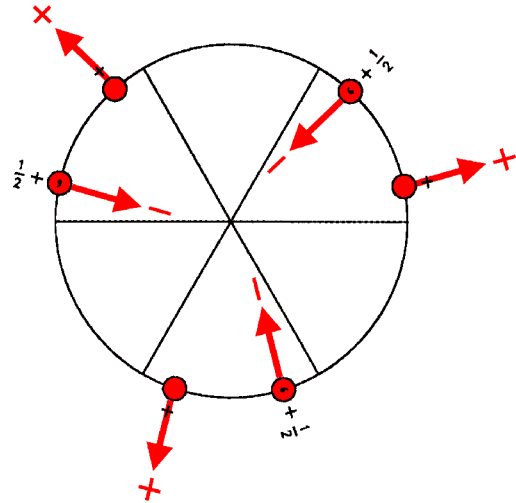
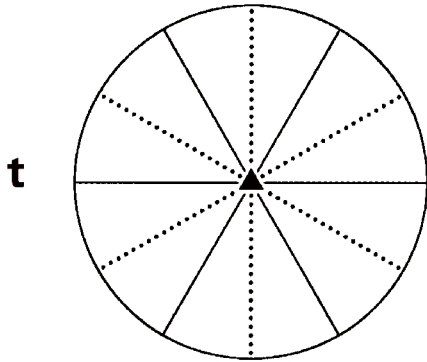
$p3c1$

No. 50.1.256

$3m1$

$p3c1$

Trigonal



Origin on $3c1$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) c (0,0,1/2) x, \bar{x}, z
(m_{xy} |0,0,1/2)

(5) c (0,0,1/2) $x, 2x, z$
(m_x |0,0,1/2)

(6) c (0,0,1/2) $2x, x, z$
(m_y |0,0,1/2)

Continued

No. 50.1.256

$p3c1$

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
6 b 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{y},\bar{x},z+1/2$ [v,u,\bar{w}]	(5) $\bar{x}+y,y,z+1/2$ [$u-v,\bar{v},\bar{w}$]	(6) $x,x-y,z+1/2$ [$\bar{u},\bar{u}+v,\bar{w}$]
1 a 3..	$0,0,z$ [$0,0,w$]	$0,0,z+1/2$ [$0,0,\bar{w}$]	

Symmetry of special projections

Along [001] $3m$	Along [100] $p_{2a^*} 1$	Along [210] $p11g$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

$p3c11'$

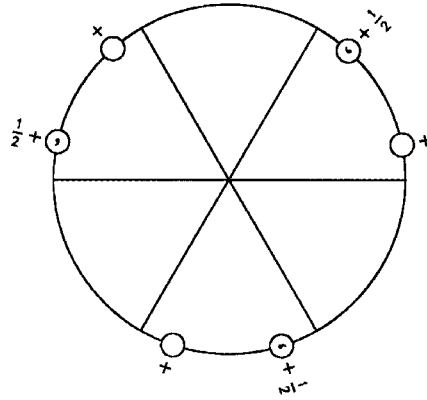
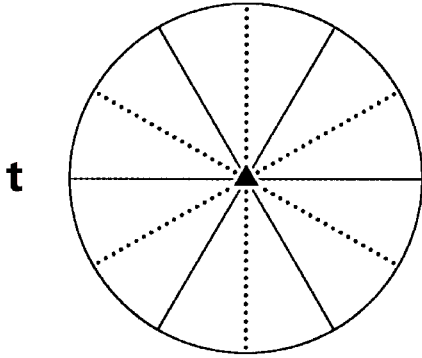
$3m11'$

Trigonal

No. 50.2.257

$p3c11'$

1'



Origin on $3c11'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

(1) 1
($1|0,0,0$)

(2) 3^+ $0,0,z$
($3_z|0,0,0$)

(3) 3^- $0,0,z$
($3_z^{-1}|0,0,0$)

(4) c $(0,0,1/2)$ x, \bar{x}, z
($m_{xy}|0,0,1/2$)

(5) c $(0,0,1/2)$ $x, 2x, z$
($m_x|0,0,1/2$)

(6) c $(0,0,1/2)$ $2x, x, z$
($m_y|0,0,1/2$)

For $1' +$ set

(1) $1'$
($1|0,0,0$)'

(2) $3^{+'}$ $0,0,z$
($3_z|0,0,0$)'

(3) $3^{-'}$ $0,0,z$
($3_z^{-1}|0,0,0$)'

(4) c' $(0,0,1/2)$ x, \bar{x}, z
($m_{xy}|0,0,1/2$)'

(5) c' $(0,0,1/2)$ $x, 2x, z$
($m_x|0,0,1/2$)'

(6) c' $(0,0,1/2)$ $2x, x, z$
($m_y|0,0,1/2$)'

Continued

No. 50.2.257

$p3c11'$

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1'+$	
6 b $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) $\bar{y},\bar{x},z+1/2$ [0,0,0]	(5) $\bar{x}+y,y,z+1/2$ [0,0,0]	(6) $x,x-y,z+1/2$ [0,0,0]
1 a $3..1'$	$0,0,z$ [0,0,0]	$0,0,z+1/2$ [0,0,0]	

Symmetry of special projections

Along [001] $3m1'$	Along [100] $p11'$ $a^* = c/2$	Along [210] $p11g1'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

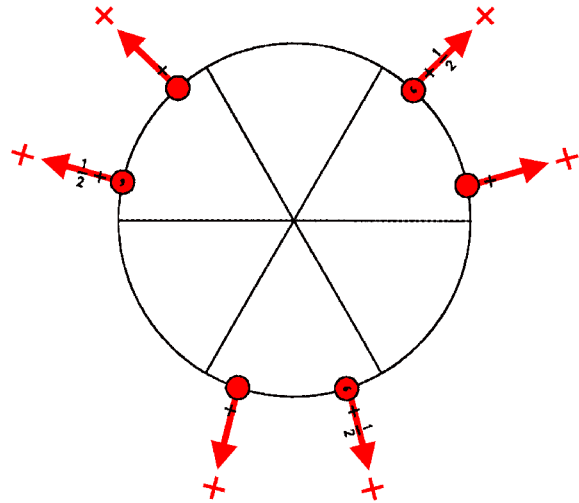
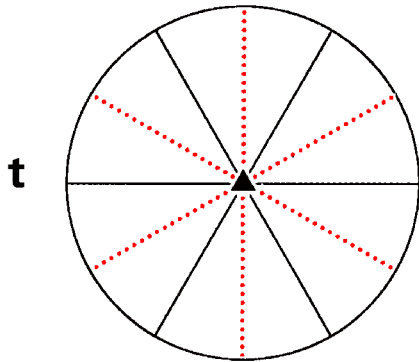
$p3c'1$

No. 50.3.258

$3m'1$

$p3c'1$

Trigonal



Origin on $3c'1$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) c' (0,0,1/2) x, \bar{x}, z
(m_{xy} |0,0,1/2)'

(5) c' (0,0,1/2) $x, 2x, z$
(m_x |0,0,1/2)'

(6) c' (0,0,1/2) $2x, x, z$
(m_y |0,0,1/2)'

Continued

No. 50.3.258

$p3c'1$

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

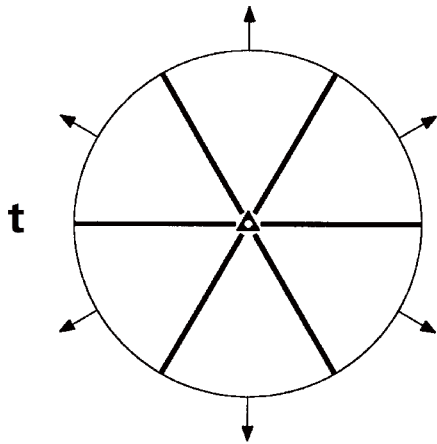
	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
6 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{y},\bar{x},z+1/2 [\bar{v},\bar{u},w]$	(5) $\bar{x}+y,y,z+1/2 [\bar{u}+v,v,w]$	(6) $x,x-y,z+1/2 [u,u-v,w]$
1 a 3..	$0,0,z [0,0,w]$	$0,0,z+1/2 [0,0,w]$	

Symmetry of special projections

Along [001] $3m'$	Along [100] $p1$ $a^* = c/2$	Along [210] $p11g'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

$p\bar{3}1m$

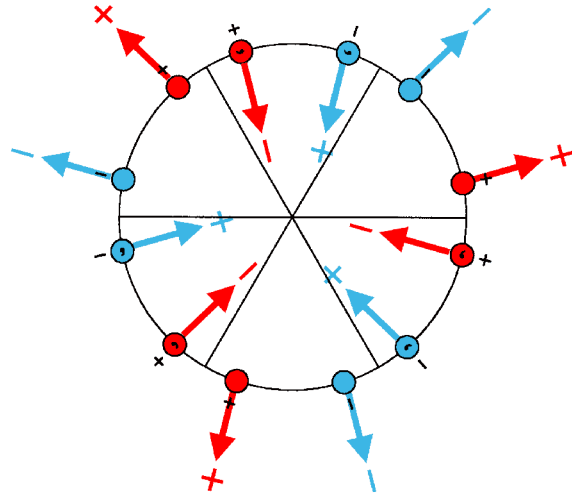
No. 51.1.259



$\bar{3}1m$

$p\bar{3}12/m$

Trigonal



Origin at center ($\bar{3}1m$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x, \bar{x} ,0
(2_3 0,0,0) | (5) 2 x,2x,0
(2_2 0,0,0) | (6) 2 2x,x,0
(2_1 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m x,x,z
(m_3 0,0,0) | (11) m x,0,z
(m_2 0,0,0) | (12) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 g 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]$	(5) $\bar{x}+y,y,\bar{z} [\bar{u}+v,v,\bar{w}]$	(6) $x,x-y,\bar{z} [u,u-v,\bar{w}]$
	(7) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(8) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$	(9) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$
	(10) $y,x,z [\bar{v},\bar{u},\bar{w}]$	(11) $x-y,\bar{y},z [\bar{u}+v,v,\bar{w}]$	(12) $\bar{x},\bar{x}+y,z [u,u-v,\bar{w}]$
6 f ..m	$x,0,z [u,2u,0]$	$0,x,z [2\bar{u},\bar{u},0]$	$\bar{x},\bar{x},z [u,\bar{u},0]$
	$0,\bar{x},\bar{z} [2\bar{u},\bar{u},0]$	$\bar{x},0,\bar{z} [u,2u,0]$	$x,x,\bar{z} [u,\bar{u},0]$
6 e ..2	$x,\bar{x},1/2 [u,\bar{u},0]$	$x,2x,1/2 [u,2u,0]$	$2\bar{x},\bar{x},1/2 [2\bar{u},\bar{u},0]$
	$\bar{x},x,1/2 [u,\bar{u},0]$	$\bar{x},2\bar{x},1/2 [2\bar{u},\bar{u},0]$	$2x,x,1/2 [u,2u,0]$
6 d ..2	$x,\bar{x},0 [u,\bar{u},0]$	$x,2x,0 [u,2u,0]$	$2\bar{x},\bar{x},0 [2\bar{u},\bar{u},0]$
	$\bar{x},x,0 [u,\bar{u},0]$	$\bar{x},2\bar{x},0 [2\bar{u},\bar{u},0]$	$2x,x,0 [u,2u,0]$
2 c 3.m	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 b $\bar{3}.m$	$0,0,1/2 [0,0,0]$		
1 a $\bar{3}.m$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $6'm'm$	Along [100] $p2'm'm$	Along [210] $p2111'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

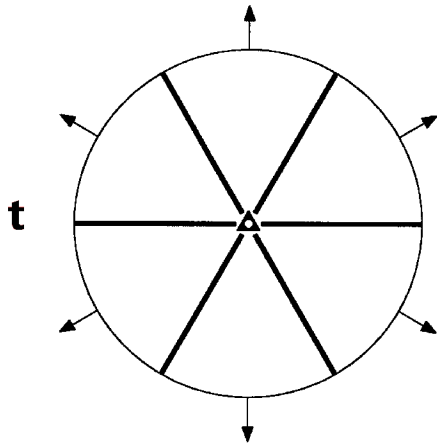
$p\bar{3}1m1'$

$\bar{3}1m1'$

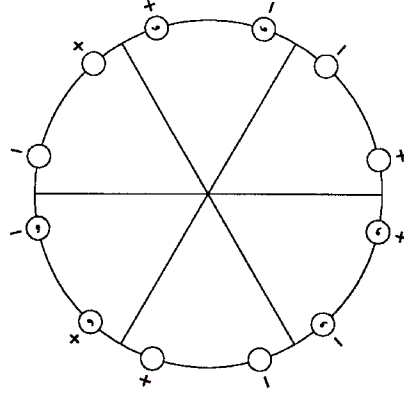
Trigonal

No. 51.2.260

$p\bar{3}12/m1'$



1'



Origin at center ($\bar{3}1m1'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

For 1 + set

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x, \bar{x} ,0
(2_3 0,0,0) | (5) 2 x,2x,0
(2_2 0,0,0) | (6) 2 2x,x,0
(2_1 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m x,x,z
(m_3 0,0,0) | (11) m x,0,z
(m_2 0,0,0) | (12) m 0,y,z
(m_1 0,0,0) |

For 1' + set

- | | | |
|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) 2' x, \bar{x} ,0
(2_3 0,0,0)' | (5) 2' x,2x,0
(2_2 0,0,0)' | (6) 2' 2x,x,0
(2_1 0,0,0)' |
| (7) $\bar{1}'$ 0,0,0
($\bar{1}'$ 0,0,0) | (8) $\bar{3}^{+'}$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^{-'}$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' x,0,z
(m_2 0,0,0)' | (12) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

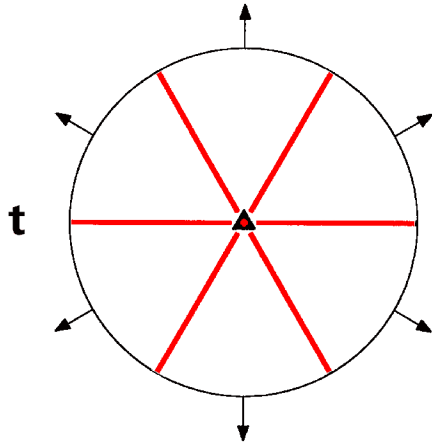
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1' +$	
12 g $11'$	(1) x,y,z [0,0,0] (4) \bar{y},\bar{x},\bar{z} [0,0,0] (7) \bar{x},\bar{y},\bar{z} [0,0,0] (10) y,x,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0] (5) $\bar{x}+y,y,\bar{z}$ [0,0,0] (8) $y,\bar{x}+y,\bar{z}$ [0,0,0] (11) $x-y,\bar{y},z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0] (6) $x,x-y,\bar{z}$ [0,0,0] (9) $x-y,x,\bar{z}$ [0,0,0] (12) $\bar{x},\bar{x}+y,z$ [0,0,0]
6 f $\bar{3}m1'$	$x,0,z$ [0,0,0] $0,\bar{x},\bar{z}$ [0,0,0]	$0,x,z$ [0,0,0] $\bar{x},0,\bar{z}$ [0,0,0]	\bar{x},\bar{x},z [0,0,0] x,x,\bar{z} [0,0,0]
6 e $\bar{3}21'$	$x,\bar{x},1/2$ [0,0,0] $\bar{x},x,1/2$ [0,0,0]	$x,2x,1/2$ [0,0,0] $\bar{x},2\bar{x},1/2$ [0,0,0]	$2\bar{x},\bar{x},1/2$ [0,0,0] $2x,x,1/2$ [0,0,0]
6 d $\bar{3}21'$	$x,\bar{x},0$ [0,0,0] $\bar{x},x,0$ [0,0,0]	$x,2x,0$ [0,0,0] $\bar{x},2\bar{x},0$ [0,0,0]	$2\bar{x},\bar{x},0$ [0,0,0] $2x,x,0$ [0,0,0]
2 c $3m1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
1 b $\bar{3}m1'$	$0,0,1/2$ [0,0,0]		
1 a $\bar{3}m1'$	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $p2mm1'$	Along [210] $p2111'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

$p\bar{3}1m'$

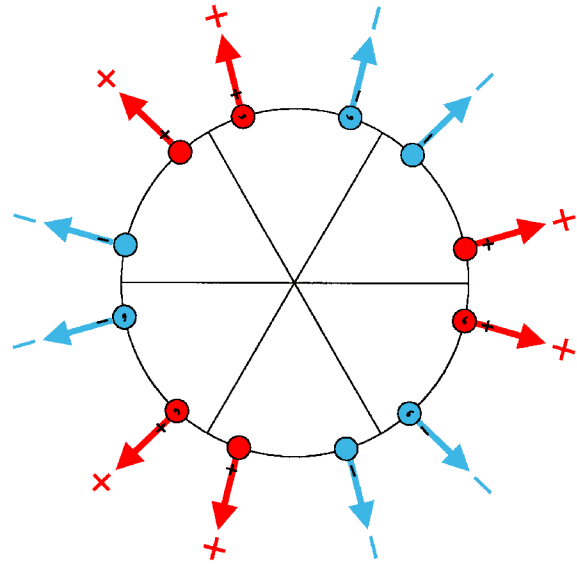
No. 51.3.261



$\bar{3}1m'$

$p\bar{3}12/m'$

Trigonal



Origin at center ($\bar{3}1m'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x, \bar{x} ,0
(2_3 0,0,0) | (5) 2 x,2x,0
(2_2 0,0,0) | (6) 2 2x,x,0
(2_1 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' x,0,z
(m_2 0,0,0)' | (12) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

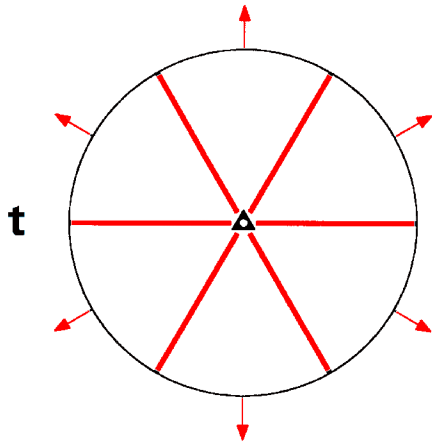
	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 g 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(5) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(6) $x,x-y,\bar{z}$ [$u,u-v,\bar{w}$]
	(7) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(8) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(9) $x-y,x,\bar{z}$ [$u-v,u,\bar{w}$]
	(10) y,x,z [v,u,w]	(11) $x-y,\bar{y},z$ [$u-v,\bar{v},w$]	(12) $\bar{x},\bar{x}+y,z$ [$\bar{u},\bar{u}+v,w$]
6 f $\bar{3}m'$	$x,0,z$ [$u,0,w$]	$0,x,z$ [$0,u,w$]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]
	$0,\bar{x},\bar{z}$ [$0,\bar{u},\bar{w}$]	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,x,\bar{z} [u,u,\bar{w}]
6 e $\bar{3}2$	$x,\bar{x},1/2$ [$u,\bar{u},0$]	$x,2x,1/2$ [$u,2u,0$]	$2\bar{x},\bar{x},1/2$ [$2\bar{u},\bar{u},0$]
	$\bar{x},x,1/2$ [$\bar{u},u,0$]	$\bar{x},2\bar{x},1/2$ [$\bar{u},2\bar{u},0$]	$2x,x,1/2$ [$2u,u,0$]
6 d $\bar{3}2$	$x,\bar{x},0$ [$u,\bar{u},0$]	$x,2x,0$ [$u,2u,0$]	$2\bar{x},\bar{x},0$ [$2\bar{u},\bar{u},0$]
	$\bar{x},x,0$ [$\bar{u},u,0$]	$\bar{x},2\bar{x},0$ [$\bar{u},2\bar{u},0$]	$2x,x,0$ [$2u,u,0$]
2 c $3m'$	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	
1 b $\bar{3}'m'$	$0,0,1/2$ [$0,0,0$]		
1 a $\bar{3}'m'$	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $6m'm'$	Along [100] $\rho 2m'm'$	Along [210] $\rho 211$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

$p\bar{3}1m'$

No. 51.4.262



Origin at center ($\bar{3}1m'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

(1) 1
(1|0,0,0)

(4) $2'$ $x, \bar{x}, 0$
(2_3 |0,0,0)'

(7) $\bar{1}$ $0,0,0$
($\bar{1}$ |0,0,0)

(10) m' x,x,z
(m_3 |0,0,0)'

(2) 3^+ $0,0,z$
(3_2 |0,0,0)

(5) $2'$ $x, 2x, 0$
(2_2 |0,0,0)'

(8) $\bar{3}^+$ $0,0,z; 0,0,0$
($\bar{3}_2$ |0,0,0)

(11) m' $x,0,z$
(m_2 |0,0,0)'

(3) 3^- $0,0,z$
(3_2^{-1} |0,0,0)

(6) $2'$ $2x,x,0$
(2_1 |0,0,0)'

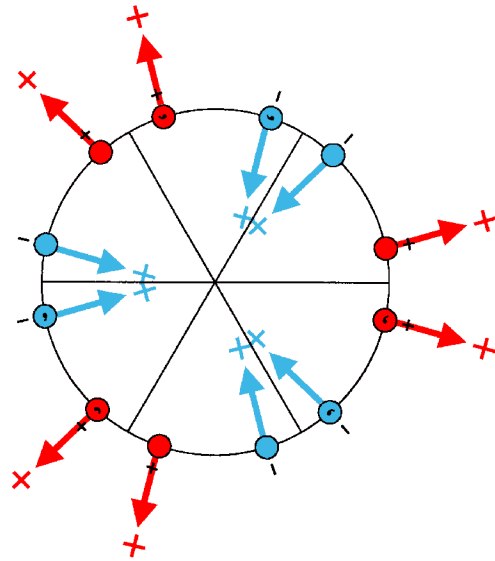
(9) $\bar{3}^-$ $0,0,z; 0,0,0$
($\bar{3}_2^{-1}$ |0,0,0)

(12) m' $0,y,z$
(m_1 |0,0,0)'

$\bar{3}1m'$

$p\bar{3}12'/m'$

Trigonal



Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 g 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{y},\bar{x},\bar{z} [v,u,w]	(5) $\bar{x}+y,y,\bar{z}$ [u-v, \bar{v},w]	(6) $x,x-y,\bar{z}$ [$\bar{u},\bar{u}+v,w$]
	(7) \bar{x},\bar{y},\bar{z} [u,v,w]	(8) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(9) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]
	(10) y,x,z [v,u,w]	(11) $x-y,\bar{y},z$ [u-v, \bar{v},w]	(12) $\bar{x},\bar{x}+y,z$ [$\bar{u},\bar{u}+v,w$]
6 f ..m'	$x,0,z$ [u,0,w]	$0,x,z$ [0,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]
	$0,\bar{x},\bar{z}$ [0,u,w]	$\bar{x},0,\bar{z}$ [u,0,w]	x,x,\bar{z} [\bar{u},\bar{u},w]
6 e ..2'	$x,\bar{x},1/2$ [u,u,w]	$x,2x,1/2$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/2$ [0, \bar{u},w]
	$\bar{x},x,1/2$ [u,u,w]	$\bar{x},2\bar{x},1/2$ [$\bar{u},0,w$]	$2x,x,1/2$ [0, \bar{u},w]
6 d ..2'	$x,\bar{x},0$ [u,u,w]	$x,2x,0$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},0$ [0, \bar{u},w]
	$\bar{x},x,0$ [u,u,w]	$\bar{x},2\bar{x},0$ [$\bar{u},0,w$]	$2x,x,0$ [0, \bar{u},w]
2 c 3.m'	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	
1 b $\bar{3}.m'$	$0,0,1/2$ [0,0,w]		
1 a $\bar{3}.m'$	$0,0,0$ [0,0,w]		

Symmetry of special projections

Along [001] $6'mm'$	Along [100] $p2'mm'$	Along [210] $p2'11$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

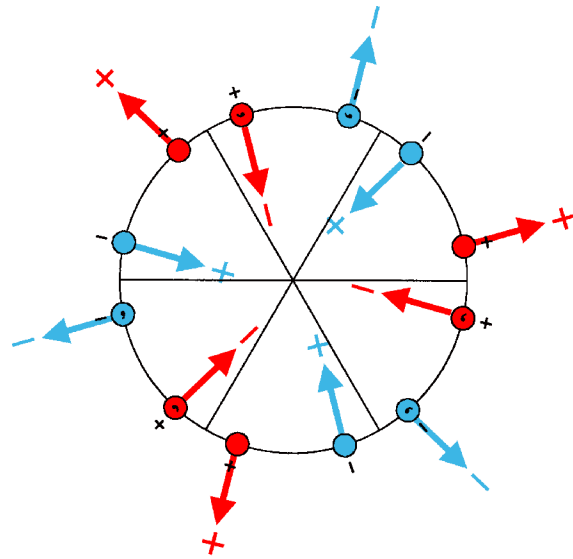
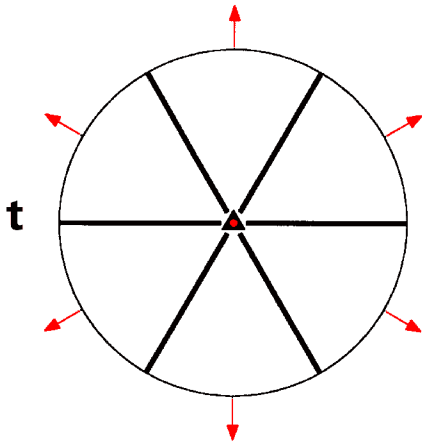
$p\bar{3}1m$

No. 51.5.263

$\bar{3}1m$

$p\bar{3}12'/m$

Trigonal



Origin at center ($\bar{3}1m$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (5) $2'$ x,2x,0
(2_2 0,0,0)' | (6) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m x,x,z
(m_3 0,0,0) | (11) m x,0,z
(m_2 0,0,0) | (12) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 g 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{y},\bar{x},\bar{z} [v,u,w]	(5) $\bar{x}+y,y,\bar{z}$ [u-v, \bar{v},w]	(6) $x,x-y,\bar{z}$ [$\bar{u},\bar{u}+v,w$]
	(7) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(8) $y,\bar{x}+y,\bar{z}$ [v, $\bar{u}+v,\bar{w}$]	(9) $x-y,x,\bar{z}$ [u-v,u, \bar{w}]
	(10) y,x,z [\bar{v},\bar{u},\bar{w}]	(11) $x-y,\bar{y},z$ [$\bar{u}+v,v,\bar{w}$]	(12) $\bar{x},\bar{x}+y,z$ [u,u-v, \bar{w}]
6 f ..m	$x,0,z$ [u,2u,0]	$0,x,z$ [2 $\bar{u},\bar{u},0$]	\bar{x},\bar{x},z [u, $\bar{u},0$]
	$0,\bar{x},\bar{z}$ [2u,u,0]	$\bar{x},0,\bar{z}$ [$\bar{u},2\bar{u},0$]	x,x,\bar{z} [$\bar{u},u,0$]
6 e ..2'	$x,\bar{x},1/2$ [u,u,w]	$x,2x,1/2$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/2$ [0, \bar{u},w]
	$\bar{x},x,1/2$ [\bar{u},\bar{u},\bar{w}]	$\bar{x},2\bar{x},1/2$ [u,0, \bar{w}]	$2x,x,1/2$ [0,u, \bar{w}]
6 d ..2'	$x,\bar{x},0$ [u,u,w]	$x,2x,0$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},0$ [0, \bar{u},w]
	$\bar{x},x,0$ [\bar{u},\bar{u},\bar{w}]	$\bar{x},2\bar{x},0$ [u,0, \bar{w}]	$2x,x,0$ [0,u, \bar{w}]
2 c 3.m	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
1 b $\bar{3}$.m	$0,0,1/2$ [0,0,0]		
1 a $\bar{3}$.m	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] 6mm	Along [100] $p2mm$	Along [210] $p2111'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

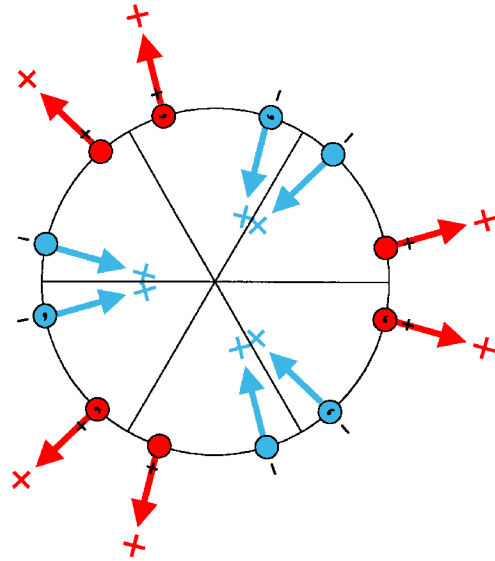
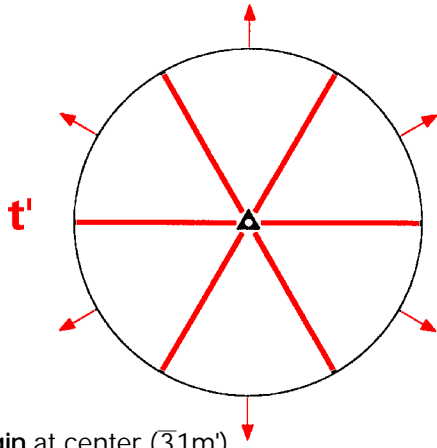
$\rho_{2c} \bar{3}1m'$

$\bar{3}1m1'$

Trigonal

No. 51.6.264

$\rho_{2c} \bar{3}12'/m'$



Origin at center ($\bar{3}1m'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

For (0,0,0) + set

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (5) $2'$ x,2x,0
(2_2 0,0,0)' | (6) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' x,0,z
(m_2 0,0,0)' | (12) m' 0,y,z
(m_1 0,0,0)' |
| For (0,0,1)' + set | | |
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) 2 x, \bar{x} ,1/2
(2_3 0,0,1) | (5) 2 x,2x,1/2
(2_2 0,0,1) | (6) 2 2x,x,1/2
(2_1 0,0,1) |
| (7) $\bar{1}'$ 0,0,1/2
($\bar{1}$ 0,0,1)' | (8) $\bar{3}^{+'}$ 0,0,z; 0,0,1/2
($\bar{3}_z$ 0,0,1)' | (9) $\bar{3}^{-'}$ 0,0,z; 0,0,1/2
($\bar{3}_z^{-1}$ 0,0,1)' |
| (10) c (0,0,1) x,x,z
(m_3 0,0,1) | (11) c (0,0,1) x,0,z
(m_2 0,0,1) | (12) c (0,0,1) 0,y,z
(m_1 0,0,1) |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
12 g 1	(1) $x,y,z [u,v,w]$ (4) $\bar{y},\bar{x},\bar{z} [v,u,w]$ (7) $\bar{x},\bar{y},\bar{z} [u,v,w]$ (10) $y,x,z [v,u,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$ (5) $\bar{x}+y,y,\bar{z} [u-v,\bar{v},w]$ (8) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$ (11) $x-y,\bar{y},z [u-v,\bar{v},w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$ (6) $x,x-y,\bar{z} [\bar{u},\bar{u}+v,w]$ (9) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$ (12) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$
6 f ..m'	$x,0,z [u,0,w]$ $0,\bar{x},\bar{z} [0,u,w]$	$0,x,z [0,u,w]$ $\bar{x},0,\bar{z} [u,0,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$ $x,x,\bar{z} [\bar{u},\bar{u},w]$
6 e ..2	$x,\bar{x},1/2 [u,\bar{u},0]$ $\bar{x},x,1/2 [\bar{u},u,0]$	$x,2x,1/2 [u,2u,0]$ $\bar{x},2\bar{x},1/2 [\bar{u},2\bar{u},0]$	$2\bar{x},\bar{x},1/2 [2\bar{u},\bar{u},0]$ $2x,x,1/2 [2u,u,0]$
6 d ..2'	$x,\bar{x},0 [u,u,w]$ $\bar{x},x,0 [u,u,w]$	$x,2x,0 [\bar{u},0,w]$ $\bar{x},2\bar{x},0 [\bar{u},0,w]$	$2\bar{x},\bar{x},0 [0,\bar{u},w]$ $2x,x,0 [0,\bar{u},w]$
2 c 3.m'	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$	
1 b $\bar{3}'$.m'	$0,0,1/2 [0,0,0]$		
1 a $\bar{3}$.m'	$0,0,0 [0,0,w]$		

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $\rho_{2a^*} 2'mm'$	Along [210] $\rho_{2a^*} 2'11$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

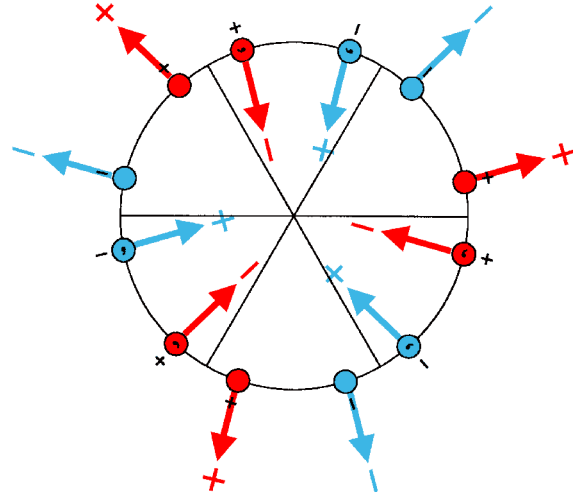
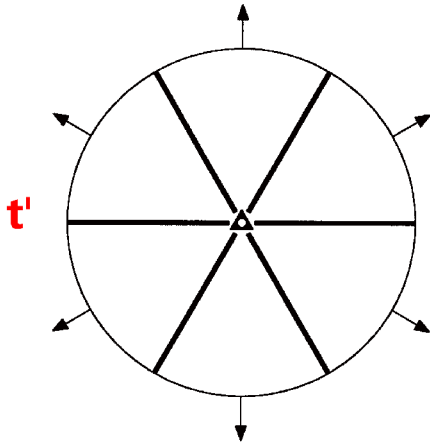
$\rho_{2c} \bar{3}1m$

No. 51.7.265

$\bar{3}1m1'$

$\rho_{2c} \bar{3}12/m$

Trigonal



Origin at center ($\bar{3}1m$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

For (0,0,0) + set

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x, \bar{x} ,0
(2_3 0,0,0) | (5) 2 x,2x,0
(2_2 0,0,0) | (6) 2 2x,x,0
(2_1 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m x,x,z
(m_3 0,0,0) | (11) m x,0,z
(m_2 0,0,0) | (12) m 0,y,z
(m_1 0,0,0) |

For (0,0,1)' + set

- | | | |
|--|---|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) 2' x, \bar{x} ,1/2
(2_3 0,0,1)' | (5) 2' x,2x,1/2
(2_2 0,0,1)' | (6) 2' 2x,x,1/2
(2_1 0,0,1)' |
| (7) $\bar{1}'$ 0,0,1/2
($\bar{1}$ 0,0,1)' | (8) $\bar{3}^{+'}$ 0,0,z; 0,0,1/2
($\bar{3}_z$ 0,0,1)' | (9) $\bar{3}^{-'}$ 0,0,z; 0,0,1/2
($\bar{3}_z^{-1}$ 0,0,1)' |
| (10) c' (0,0,1) x,x,z
(m_3 0,0,1)' | (11) c' (0,0,1) x,0,z
(m_2 0,0,1)' | (12) c' (0,0,1) 0,y,z
(m_1 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(0,0,0)+	(0,0,1)'	+
12 g 1	(1) $x,y,z [u,v,w]$ (4) $\bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]$ (7) $\bar{x},\bar{y},\bar{z} [u,v,w]$ (10) $y,x,z [\bar{v},\bar{u},\bar{w}]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$ (5) $\bar{x}+y,y,\bar{z} [\bar{u}+v,v,\bar{w}]$ (8) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$ (11) $x-y,\bar{y},z [\bar{u}+v,v,\bar{w}]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$ (6) $x,x-y,\bar{z} [u,u-v,\bar{w}]$ (9) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$ (12) $\bar{x},\bar{x}+y,z [u,u-v,\bar{w}]$
6 f ..m	$x,0,z [u,2u,0]$ $0,\bar{x},\bar{z} [2\bar{u},\bar{u},0]$	$0,x,z [2\bar{u},\bar{u},0]$ $\bar{x},0,\bar{z} [u,2u,0]$	$\bar{x},\bar{x},z [u,\bar{u},0]$ $x,x,\bar{z} [u,\bar{u},0]$
6 e ..2'	$x,\bar{x},1/2 [u,u,w]$ $\bar{x},x,1/2 [\bar{u},\bar{u},\bar{w}]$	$x,2x,1/2 [\bar{u},0,w]$ $\bar{x},2\bar{x},1/2 [u,0,\bar{w}]$	$2\bar{x},\bar{x},1/2 [0,\bar{u},w]$ $2x,x,1/2 [0,u,\bar{w}]$
6 d ..2	$x,\bar{x},0 [u,\bar{u},0]$ $\bar{x},x,0 [u,\bar{u},0]$	$x,2x,0 [u,2u,0]$ $\bar{x},2\bar{x},0 [u,2u,0]$	$2\bar{x},\bar{x},0 [2\bar{u},\bar{u},0]$ $2x,x,0 [2\bar{u},\bar{u},0]$
2 c 3.m	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 b $\bar{3}'$.m	$0,0,1/2 [0,0,0]$		
1 a $\bar{3}$.m	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $\rho_{2a^*} 2'm'm$	Along [210] ρ_{2111}'
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

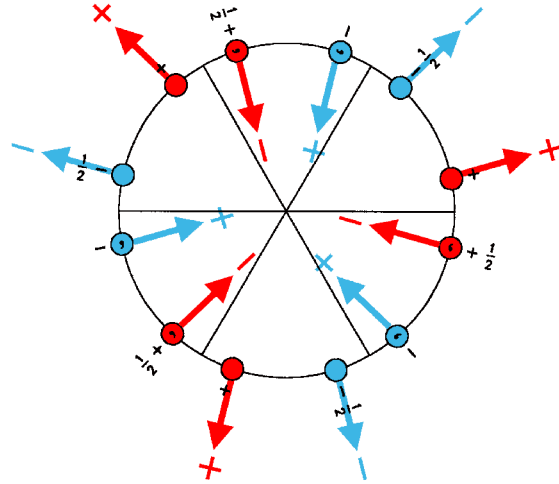
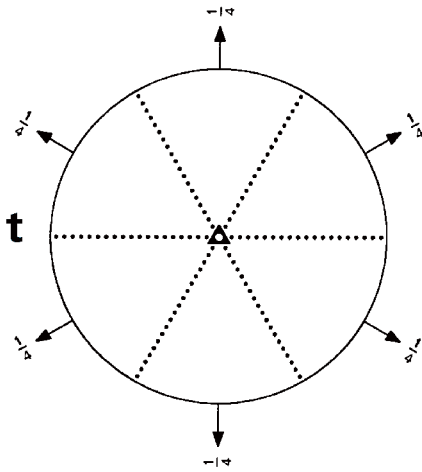
$p\bar{3}1c$

No. 52.1.266

$\bar{3}1m$

$p\bar{3}12/c$

Trigonal



Origin at center ($\bar{3}$) at $\bar{3}1c$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (5) 2 x,2x,1/4
(2_2 0,0,1/2) | (6) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (11) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (12) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
12 e 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]	
	(4) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(5) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(6) $x,x-y,\bar{z}+1/2$ [$u,u-v,\bar{w}$]	
	(7) \bar{x},\bar{y},\bar{z} [u,v,w]	(8) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(9) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]	
	(10) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $x-y,\bar{y},z+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $\bar{x},\bar{x}+y,z+1/2$ [$u,u-v,\bar{w}$]	
6 d ..2	$x,\bar{x},1/4$ [$u,\bar{u},0$]	$x,2x,1/4$ [$u,2u,0$]	$2\bar{x},\bar{x},1/4$ [$2\bar{u},\bar{u},0$]	
	$\bar{x},x,3/4$ [$u,\bar{u},0$]	$\bar{x},2\bar{x},3/4$ [$u,2u,0$]	$2x,x,3/4$ [$2\bar{u},\bar{u},0$]	
4 c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}+1/2$ [$0,0,\bar{w}$]	$0,0,\bar{z}$ [$0,0,w$]	$0,0,z+1/2$ [$0,0,\bar{w}$]
2 b $\bar{3}$..	$0,0,0$ [$0,0,w$]	$0,0,1/2$ [$0,0,\bar{w}$]		
1 a 3.2	$0,0,1/4$ [$0,0,0$]	$0,0,3/4$ [$0,0,0$]		

Symmetry of special projections

Along [001] $6'm'm$	Along [100] $\rho 2'm'g$	Along [210] $\rho_{2a^*} 2'11$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c/2$ Origin at $x,x/2,0$

$p\bar{3}1c1'$

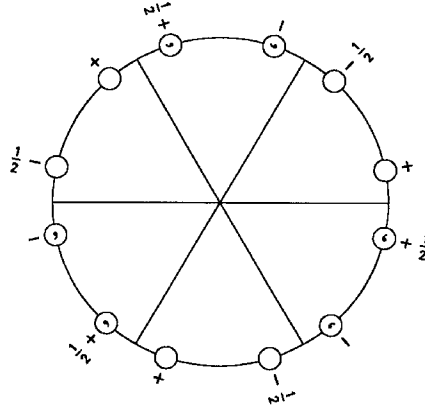
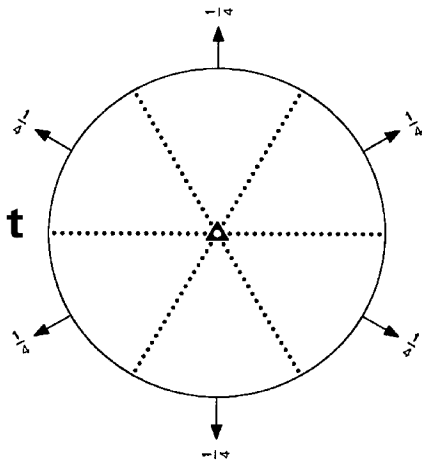
$\bar{3}1m1'$

Trigonal

No. 52.2.267

$p\bar{3}12/c1'$

1'



Origin at center ($\bar{3}1'$) at $\bar{3}1c1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

For 1 + set

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (5) 2 x,2x,1/4
(2_2 0,0,1/2) | (6) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (11) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (12) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

For 1' + set

- | | | |
|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) 2' x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (5) 2' x,2x,1/4
(2_2 0,0,1/2)' | (6) 2' 2x,x,1/4
(2_1 0,0,1/2)' |
| (7) $\bar{1}'$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^{+'}$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^{-'}$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (11) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (12) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

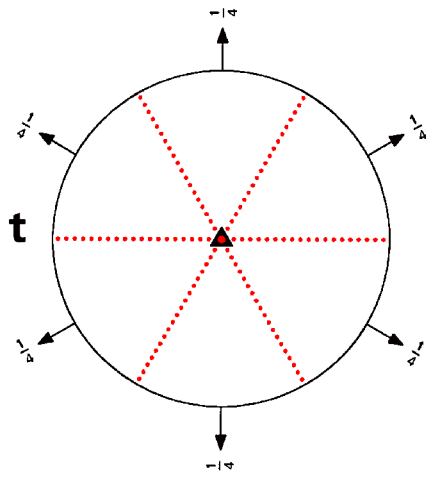
Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		1+	1'+	
12 e $11'$	(1) x,y,z [0,0,0] (4) $\bar{y},\bar{x},\bar{z}+1/2$ [0,0,0] (7) \bar{x},\bar{y},\bar{z} [0,0,0] (10) $y,x,z+1/2$ [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0] (5) $\bar{x}+y,y,\bar{z}+1/2$ [0,0,0] (8) $y,\bar{x}+y,\bar{z}$ [0,0,0] (11) $x-y,\bar{y},z+1/2$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0] (6) $x,x-y,\bar{z}+1/2$ [0,0,0] (9) $x-y,x,\bar{z}$ [0,0,0] (12) $\bar{x},\bar{x}+y,z+1/2$ [0,0,0]	
6 d $..21'$	$x,\bar{x},1/4$ [0,0,0] $\bar{x},x,3/4$ [0,0,0]	$x,2x,1/4$ [0,0,0] $\bar{x},2\bar{x},3/4$ [0,0,0]	$2\bar{x},\bar{x},1/4$ [0,0,0] $2x,x,3/4$ [0,0,0]	
4 c $3..1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}+1/2$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	$0,0,z+1/2$ [0,0,0]
2 b $\bar{3}..1'$	$0,0,0$ [0,0,0]		$0,0,1/2$ [0,0,0]	
1 a $3.21'$	$0,0,1/4$ [0,0,0]		$0,0,3/4$ [0,0,0]	

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $p2mg1'$	Along [210] $p2111'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

$p\bar{3}'1c'$

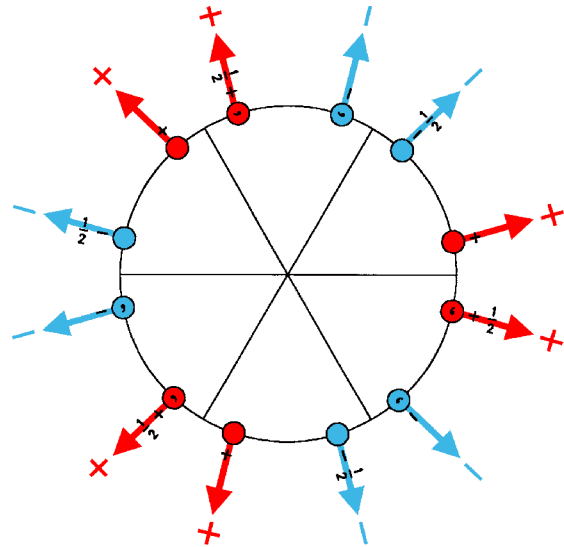
No. 52.3.268



$\bar{3}'1m'$

$p\bar{3}'12/c'$

Trigonal



Origin at center ($\bar{3}'$) at $\bar{3}'1c'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (5) 2 x,2x,1/4
(2_2 0,0,1/2) | (6) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (11) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (12) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

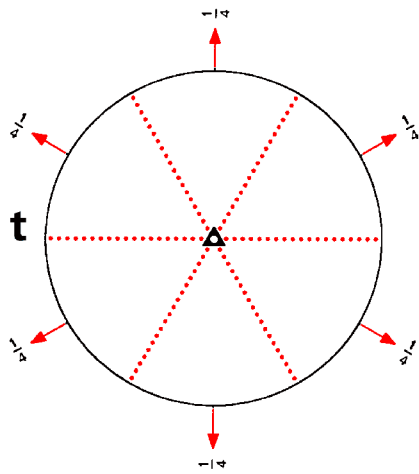
Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
12 e 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]	
	(4) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(5) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(6) $x,x-y,\bar{z}+1/2$ [$u,u-v,\bar{w}$]	
	(7) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(8) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(9) $x-y,x,\bar{z}$ [$u-v,u,\bar{w}$]	
	(10) $y,x,z+1/2$ [v,u,w]	(11) $x-y,\bar{y},z+1/2$ [$u-v,\bar{v},w$]	(12) $\bar{x},\bar{x}+y,z+1/2$ [$\bar{u},\bar{u}+v,w$]	
6 d ..2	$x,\bar{x},1/4$ [$u,\bar{u},0$]	$x,2x,1/4$ [$u,2u,0$]	$2\bar{x},\bar{x},1/4$ [$2\bar{u},\bar{u},0$]	
	$\bar{x},x,3/4$ [$\bar{u},u,0$]	$\bar{x},2\bar{x},3/4$ [$\bar{u},2\bar{u},0$]	$2x,x,3/4$ [$2u,u,0$]	
4 c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}+1/2$ [$0,0,\bar{w}$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	$0,0,z+1/2$ [$0,0,w$]
2 b $\bar{3}'..$	$0,0,0$ [$0,0,0$]	$0,0,1/2$ [$0,0,0$]		
1 a 3.2	$0,0,1/4$ [$0,0,0$]	$0,0,3/4$ [$0,0,0$]		

Symmetry of special projections

Along [001] $6m'm'$ Origin at $0,0,z$ Along [100] $p2m'g'$ $a^* = c$ Origin at $x,0,0$ Along [210] $p211$ $a^* = c/2$ Origin at $x,x/2,0$

$p\bar{3}1c'$

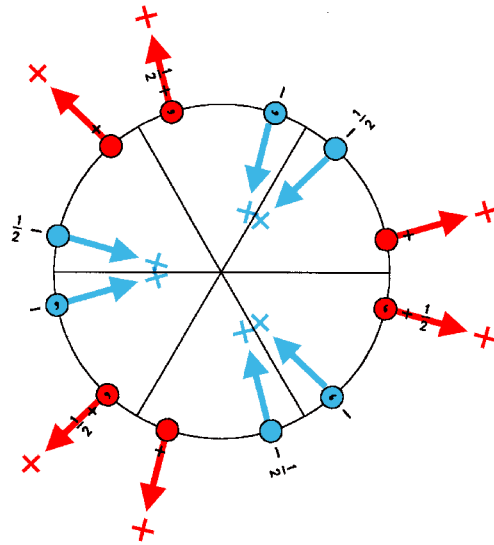
No. 52.4.269



$\bar{3}1m'$

$p\bar{3}12'/c'$

Trigonal



Origin at center ($\bar{3}$) at $\bar{3}1c'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (5) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (6) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (11) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (12) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

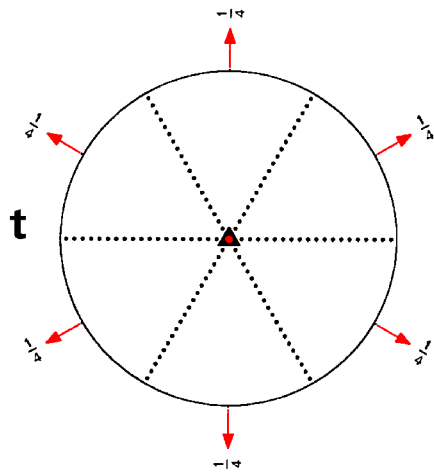
Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
12 e 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [\bar{v} ,u-v,w]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u}$,w]	
	(4) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	(5) $\bar{x}+y,y,\bar{z}+1/2$ [u-v, \bar{v} ,w]	(6) $x,x-y,\bar{z}+1/2$ [$\bar{u},\bar{u}+v$,w]	
	(7) \bar{x},\bar{y},\bar{z} [u,v,w]	(8) $y,\bar{x}+y,\bar{z}$ [\bar{v} ,u-v,w]	(9) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u}$,w]	
	(10) $y,x,z+1/2$ [v,u,w]	(11) $x-y,\bar{y},z+1/2$ [u-v, \bar{v} ,w]	(12) $\bar{x},\bar{x}+y,z+1/2$ [$\bar{u},\bar{u}+v$,w]	
6 d ..2'	$x,\bar{x},1/4$ [u,u,w]	$x,2x,1/4$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/4$ [0, \bar{u} ,w]	
	$\bar{x},x,3/4$ [u,u,w]	$\bar{x},2\bar{x},3/4$ [$\bar{u},0,w$]	$2x,x,3/4$ [0, \bar{u} ,w]	
4 c 3..	$0,0,z$ [0,0,w]	$0,0,\bar{z}+1/2$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	$0,0,z+1/2$ [0,0,w]
2 b $\bar{3}..$	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0,w]		
1 a 3.2'	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0,w]		

Symmetry of special projections

Along [001] $6'mm'$	Along [100] $p2'mg'$	Along [210] $p2'11$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

$p\bar{3}1c$

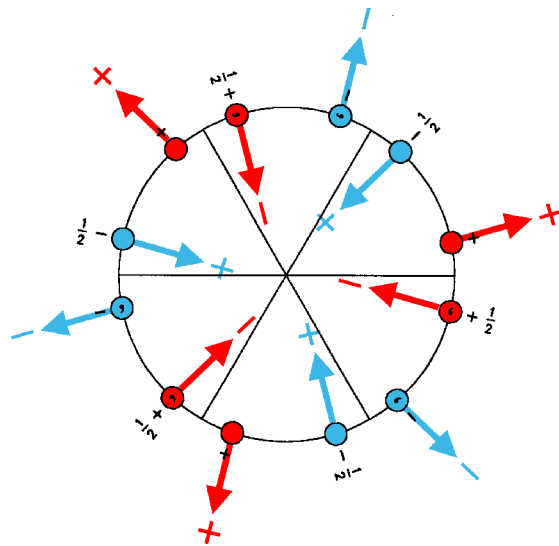
No. 52.5.270



$\bar{3}1m$

$p\bar{3}12'/c$

Trigonal



Origin at center ($\bar{3}$) at $\bar{3}1c'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (5) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (6) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |
| (7) $\bar{1}'$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (11) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (12) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
12 e 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]	
	(4) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	(5) $\bar{x}+y,y,\bar{z}+1/2$ [$u-v,\bar{v},w$]	(6) $x,x-y,\bar{z}+1/2$ [$\bar{u},\bar{u}+v,w$]	
	(7) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(8) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(9) $x-y,x,\bar{z}$ [$u-v,u,\bar{w}$]	
	(10) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $x-y,\bar{y},z+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $\bar{x},\bar{x}+y,z+1/2$ [$u,u-v,\bar{w}$]	
6 d ..2'	$x,\bar{x},1/4$ [u,u,w]	$x,2x,1/4$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/4$ [$0,\bar{u},w$]	
	$\bar{x},x,3/4$ [\bar{u},\bar{u},\bar{w}]	$\bar{x},2\bar{x},3/4$ [$u,0,\bar{w}$]	$2x,x,3/4$ [$0,u,\bar{w}$]	
4 c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}+1/2$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	$0,0,z+1/2$ [$0,0,\bar{w}$]
2 b $\bar{3}'..$	$0,0,0$ [$0,0,0$]	$0,0,1/2$ [$0,0,0$]		
1 a 3.2'	$0,0,1/4$ [$0,0,w$]	$0,0,3/4$ [$0,0,\bar{w}$]		

Symmetry of special projections

Along [001] $6mm$	Along [100] $p2mg$ $a^* = c$	Along [210] $p_{2a^*}211$ $a^* = c/2$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

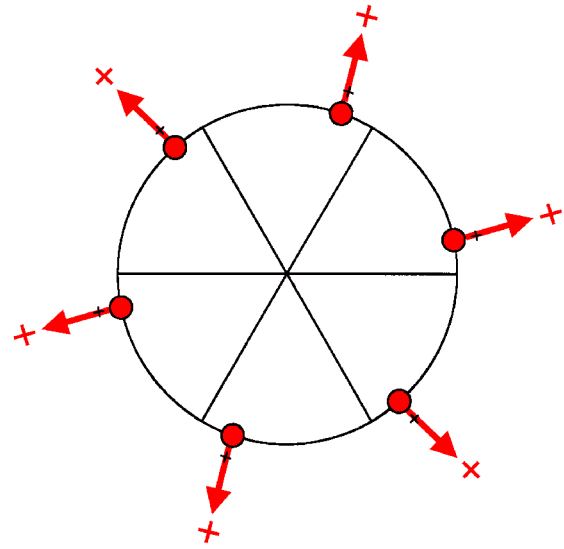
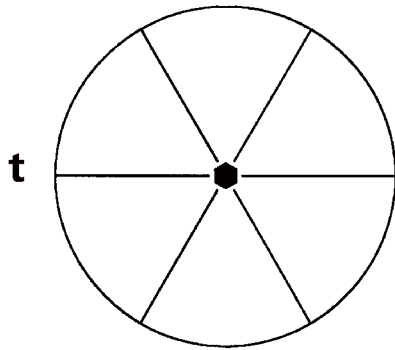
$p6$

6

Hexagonal

No. 53.1.271

$p6$



Origin on 6

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) 2 0,0,z
(2_z |0,0,0)

(5) 6^- 0,0,z
(6_z^{-1} |0,0,0)

(6) 6^+ 0,0,z
(6_z |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
6 b 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
		(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z$ [$u-v,u,w$]	
1 a 6	0,0,z [0,0,w]			

Symmetry of special projections

Along [001] 6	Along [100] $p11m'$ $a^* = c$	Along [210] $p11m'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

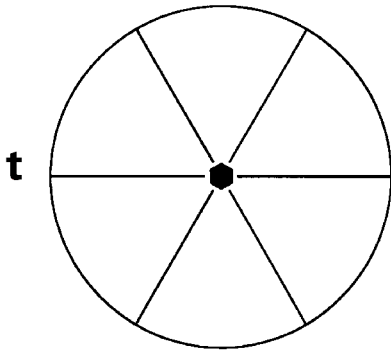
$p61'$

$61'$

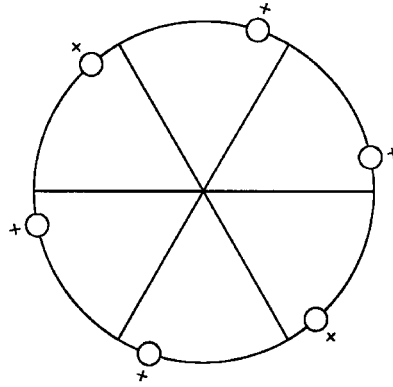
Hexagonal

No. 53.2.272

$p61'$



1'



Origin on $61'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

For $1 +$ set

(1) 1
 $(1|0,0,0)$

(2) 3^+ $0,0,z$
 $(3_z|0,0,0)$

(3) 3^- $0,0,z$
 $(3_z^{-1}|0,0,0)$

(4) 2 $0,0,z$
 $(2_z|0,0,0)$

(5) 6^- $0,0,z$
 $(6_z^{-1}|0,0,0)$

(6) 6^+ $0,0,z$
 $(6_z|0,0,0)$

For $1' +$ set

(1) $1'$
 $(1|0,0,0)'$

(2) $3^{+'}$ $0,0,z$
 $(3_z|0,0,0)'$

(3) $3^{-'}$ $0,0,z$
 $(3_z^{-1}|0,0,0)'$

(4) $2'$ $0,0,z$
 $(2_z|0,0,0)'$

(5) $6^{-'}$ $0,0,z$
 $(6_z^{-1}|0,0,0)'$

(6) $6^{+'}$ $0,0,z$
 $(6_z|0,0,0)'$

Continued

No. 53.2.272

$p61'$

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1'+$	
6 b $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) \bar{x},\bar{y},z [0,0,0]	(5) $y,\bar{x}+y,z$ [0,0,0]	(6) $x-y,x,z$ [0,0,0]
1 a $61'$	0,0,z [0,0,0]		

Symmetry of special projections

Along [001] $61'$	Along [100] $p11m1'$	Along [210] $p11m1'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

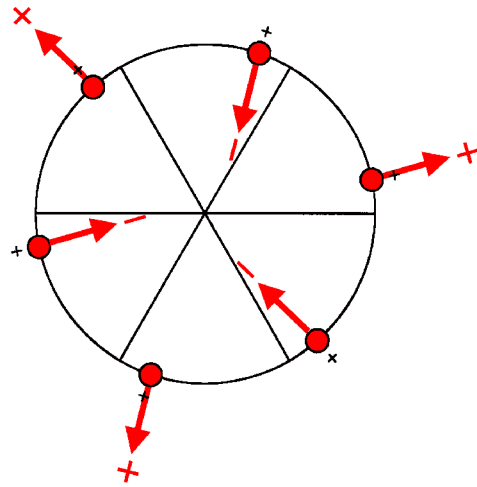
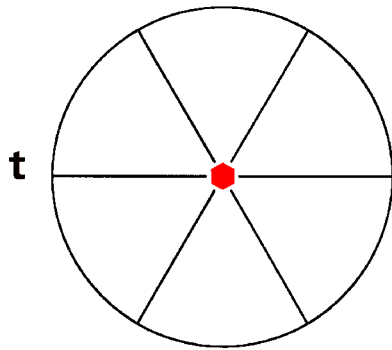
$p6'$

No. 53.3.273

$6'$

$p6'$

Hexagonal



Origin on $6'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

$$(1) 1 \\ (1|0,0,0)$$

$$(2) 3^+ 0,0,z \\ (3_z|0,0,0)$$

$$(3) 3^- 0,0,z \\ (3_z^{-1}|0,0,0)$$

$$(4) 2' 0,0,z \\ (2_z|0,0,0)'$$

$$(5) 6^- 0,0,z \\ (6_z^{-1}|0,0,0)'$$

$$(6) 6^+ 0,0,z \\ (6_z|0,0,0)'$$

Continued

No. 53.3.273

$p6'$

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
6 b 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v,\bar{w}]	(5) $y,\bar{x}+y,z$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z$ [$\bar{u}+v,\bar{u},\bar{w}$]
1 a $6'$	0,0,z [0,0,0]		

Symmetry of special projections

Along [001] $6'$	Along [100] $p11m$ $a^* = c$	Along [210] $p11m$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

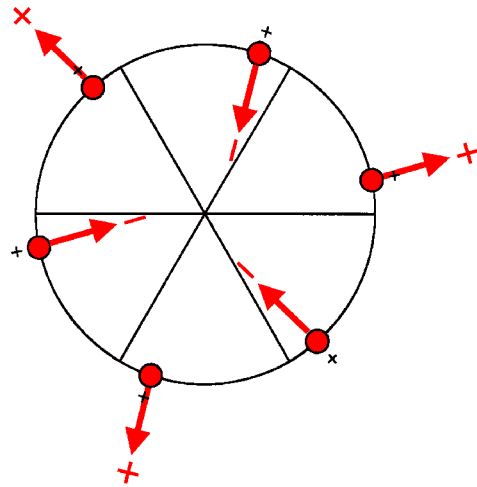
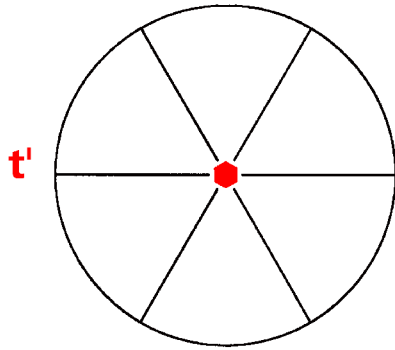
$p_{2c}6'$

$61'$

Hexagonal

No. 53.4.274

$p_{2c}6'$



Origin on $6'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

For $(0,0,0)$ + set

- | | | |
|------------------------------------|---------------------------------------|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^+ 0,0,z
(6_z^+ 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |

For $(0,0,1)$ + set

- | | | |
|--|---|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+ '}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{- '}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) 2 (0,0,1) 0,0,z
(2_z 0,0,1) | (5) 6^+ (0,0,1) 0,0,z
(6_z^+ 0,0,1) | (6) 6^+ (0,0,1) 0,0,z
(6_z 0,0,1) |

Continued

No. 53.4.274

 $\rho_{2c} 6'$ Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

		Coordinates		
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)' +	
6	b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
		(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z [\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z [\bar{u}+v,\bar{u},\bar{w}]$
1	a 6'	0,0,z [0,0,0]		

Symmetry of special projections

Along [001] $61'$	Along [100] $\rho_{2a^*} 11m$ $a^* = c$	Along [210] $\rho_{2a^*} 11m$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

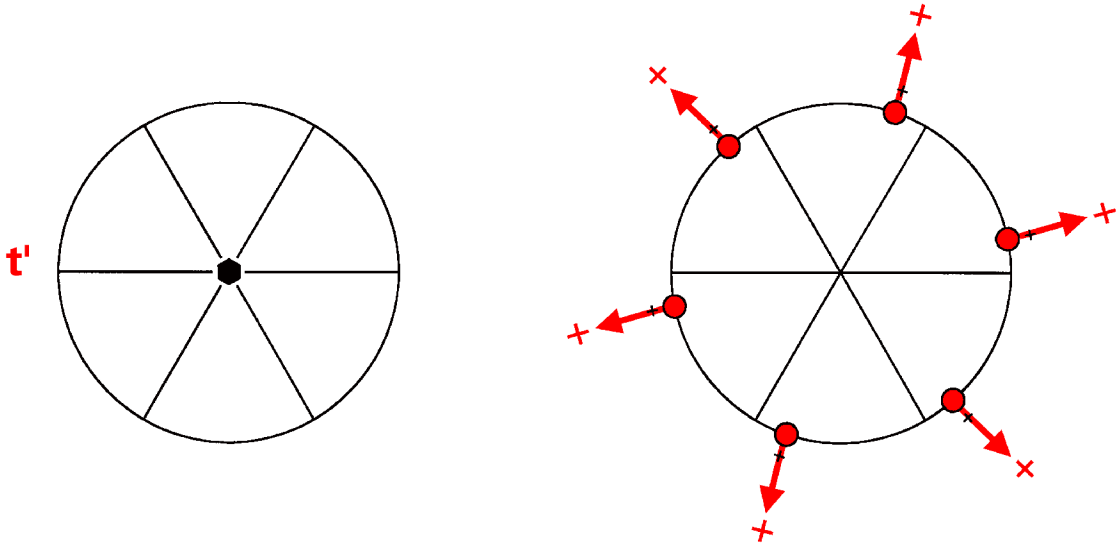
$p_{2c}6$

$61'$

Hexagonal

No. 53.5.275

$p_{2c}6$



Origin on 6

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

For $(0,0,0)$ + set

- | | | |
|--------------------------------|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |

For $(0,0,1)'$ + set

- | | | |
|--|---|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) $2'$ (0,0,1) 0,0,z
(2_z 0,0,1)' | (5) $6^{-'}$ (0,0,1) 0,0,z
(6_z^{-1} 0,0,1)' | (6) $6^{+'}$ (0,0,1) 0,0,z
(6_z 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

		Coordinates		
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,0,1)' +	
6	b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
		(4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z [v,\bar{u}+v,w]$	(6) $x-y,x,z [u-v,u,w]$
1	a 6	0,0,z [0,0,w]		

Symmetry of special projections

Along [001] $61'$	Along [100] $p_{2a^*} 11m'$	Along [210] $p_{2a^*} 11m'$
	$a^* = c$	$a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

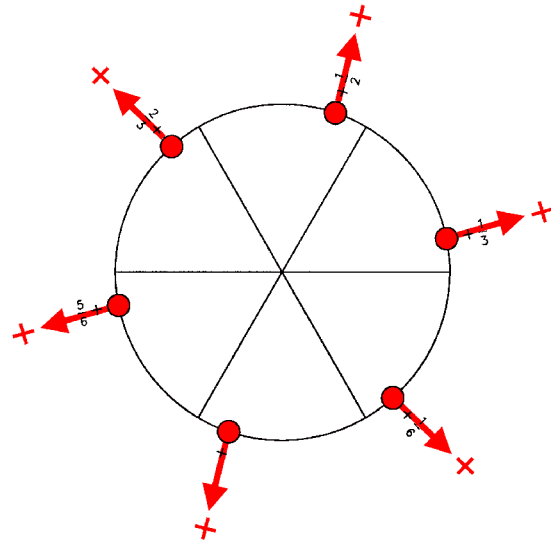
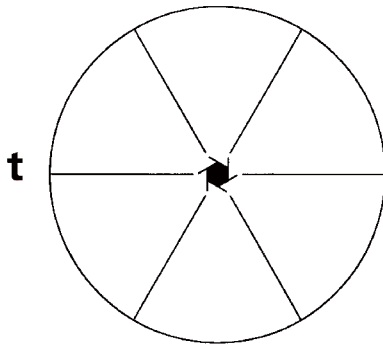
$p6_1$

6

Hexagonal

No. 54.1.276

$p6_1$



Origin on 6_1

Asymmetric unit $0 \leq z \leq 1/6$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,1/3) 0,0,z
(3_z |0,0,1/3)

(3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} |0,0,2/3)

(4) 2 (0,0,1/2) 0,0,z
(2_z |0,0,1/2)

(5) 6^- (0,0,5/6) 0,0,z
(6_z^{-1} |0,0,5/6)

(6) 6^+ (0,0,1/6) 0,0,z
(6_z |0,0,1/6)

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z+1/3$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z+2/3$ [$\bar{u}+v, \bar{u}, w$]
6 a 1	(4) $\bar{x}, \bar{y}, z+1/2$ [\bar{u}, \bar{v}, w]	(5) $y, \bar{x}+y, z+5/6$ [$v, \bar{u}+v, w$]	(6) $x-y, x, z+1/6$ [$u-v, u, w$]

Symmetry of special projections

Along [001] 6	Along [100] $\rho 11g'$ $a^* = c$	Along [210] $\rho 11g'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

$p6_11'$

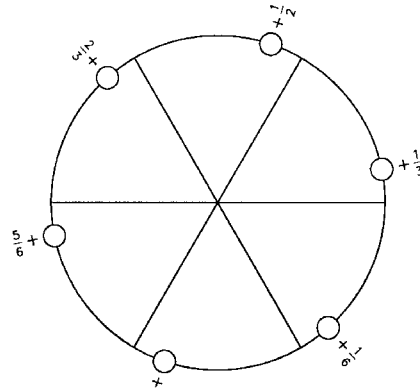
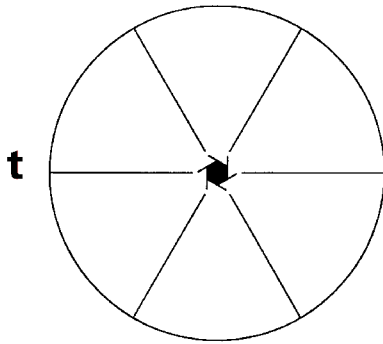
$61'$

Hexagonal

No. 54.2.277

$p6_11'$

1'



Origin on $6_11'$

Asymmetric unit $0 \leq z \leq 1/6$

Symmetry operations

For $1 +$ set

(1) 1
 $(1|0,0,0)$

(2) $3^+ (0,0,1/3) \ 0,0,z$
 $(3_z|0,0,1/3)$

(3) $3^- (0,0,2/3) \ 0,0,z$
 $(3_z^{-1}|0,0,2/3)$

(4) $2 (0,0,1/2) \ 0,0,z$
 $(2_z|0,0,1/2)$

(5) $6^- (0,0,5/6) \ 0,0,z$
 $(6_z^{-1}|0,0,5/6)$

(6) $6^+ (0,0,1/6) \ 0,0,z$
 $(6_z|0,0,1/6)$

For $1' +$ set

(1) $1'$
 $(1|0,0,0)'$

(2) $3^{+'} (0,0,1/3) \ 0,0,z$
 $(3_z|0,0,1/3)'$

(3) $3^{-'} (0,0,2/3) \ 0,0,z$
 $(3_z^{-1}|0,0,2/3)'$

(4) $2' (0,0,1/2) \ 0,0,z$
 $(2_z|0,0,1/2)'$

(5) $6^{-'} (0,0,5/6) \ 0,0,z$
 $(6_z^{-1}|0,0,5/6)'$

(6) $6^{+'} (0,0,1/6) \ 0,0,z$
 $(6_z|0,0,1/6)'$

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1' +
6 a 11'	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z+1/3$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+2/3$ [0,0,0]
	(4) $\bar{x},\bar{y},z+1/2$ [0,0,0]	(5) $y,\bar{x}+y,z+5/6$ [0,0,0]	(6) $x-y,x,z+1/6$ [0,0,0]

Symmetry of special projections

Along [001] $61'$	Along [100] $p11g1'$	Along [210] $p11g1'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

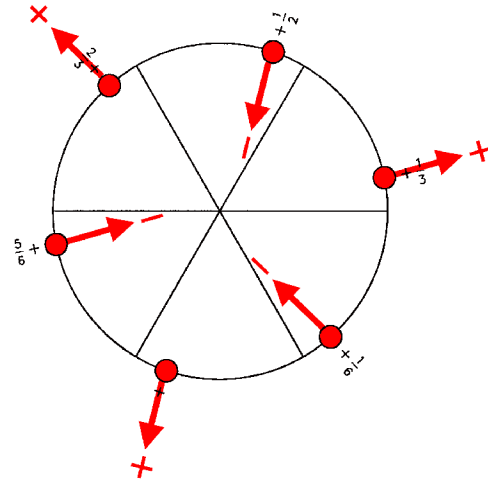
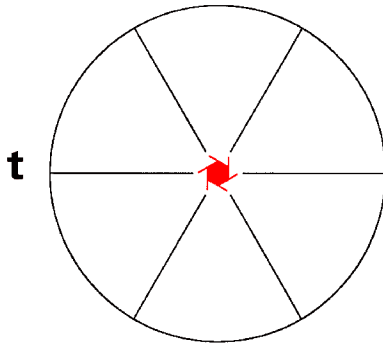
$p6_1'$

No. 54.3.278

$6'$

$p6_1'$

Hexagonal



Origin on $6_1'$

Asymmetric unit $0 \leq z \leq 1/6$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,1/3) 0,0,z
(3_z |0,0,1/3)

(3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} |0,0,2/3)

(4) $2'$ (0,0,1/2) 0,0,z
(2_z |0,0,1/2)'

(5) 6^- (0,0,5/6) 0,0,z
(6_z^{-1} |0,0,5/6)'

(6) 6^+ (0,0,1/6) 0,0,z
(6_z |0,0,1/6)'

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z+1/3$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z+2/3$ [$\bar{u}+v, \bar{u}, w$]
6 a 1	(4) $\bar{x}, \bar{y}, z+1/2$ [u,v, \bar{w}]	(5) $y, \bar{x}+y, z+5/6$ [$\bar{v}, u-v, \bar{w}$]	(6) $x-y, x, z+1/6$ [$\bar{u}+v, \bar{u}, \bar{w}$]

Symmetry of special projections

Along [001] $6'$	Along [100] $\rho 11g$	Along [210] $\rho 11g$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

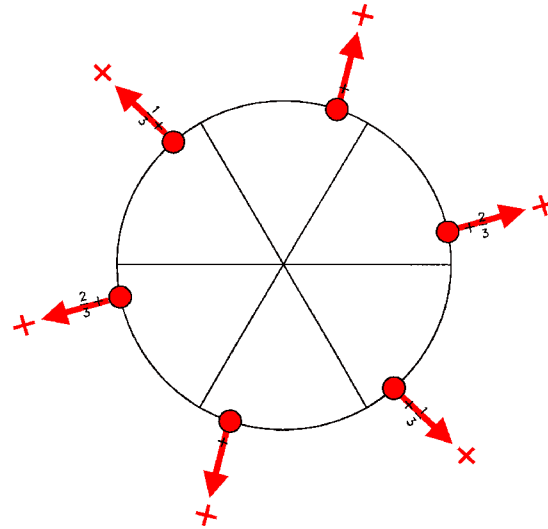
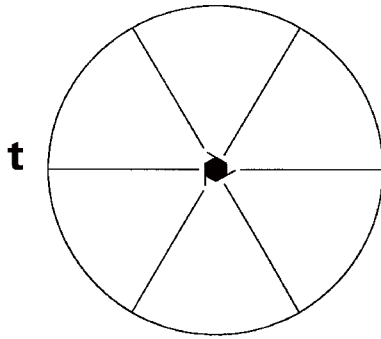
$p6_2$

6

Hexagonal

No. 55.1.279

$p6_2$



Origin on 2 on 6_2

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$; $y \leq x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,2/3) 0,0,z
(3_z |0,0,2/3)

(3) 3^- (0,0,1/3) 0,0,z
(3_z^{-1} |0,0,1/3)

(4) 2 0,0,z
(2_z |0,0,0)

(5) 6^- (0,0,2/3) 0,0,z
(6_z^{-1} |0,0,2/3)

(6) 6^+ (0,0,1/3) 0,0,z
(6_z |0,0,1/3)

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [$\bar{u}+v,\bar{u},w$]
6 b 1	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+2/3$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/3$ [$u-v,u,w$]
3 a 2..	$0,0,z$ [$0,0,w$]	$0,0,z+2/3$ [$0,0,w$]	$0,0,z+1/3$ [$0,0,w$]

Symmetry of special projections

Along [001] 6	Along [100] $p11m'$ $a^* = c$	Along [210] $p11m'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

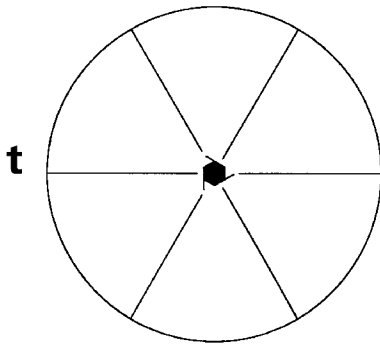
$p6_21'$

No. 55.2.280

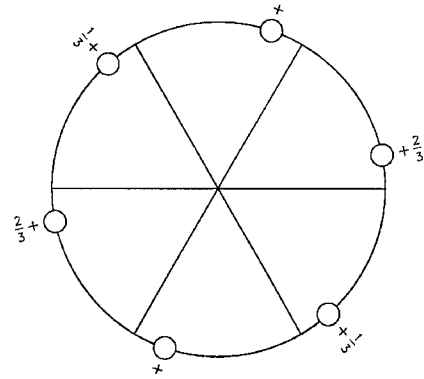
$61'$

$p6_21'$

Hexagonal



1'



Origin on $21'$ on $6_21'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$; $y \leq x$

Symmetry operations

For $1 +$ set

(1) 1
 $(1|0,0,0)$

(2) $3^+ (0,0,2/3) \ 0,0,z$
 $(3_z|0,0,2/3)$

(3) $3^- (0,0,1/3) \ 0,0,z$
 $(3_z^{-1}|0,0,1/3)$

(4) $2 \ 0,0,z$
 $(2_z|0,0,0)$

(5) $6^- (0,0,2/3) \ 0,0,z$
 $(6_z^{-1}|0,0,2/3)$

(6) $6^+ (0,0,1/3) \ 0,0,z$
 $(6_z|0,0,1/3)$

For $1' +$ set

(1) $1'$
 $(1|0,0,0)'$

(2) $3^{+'} (0,0,2/3) \ 0,0,z$
 $(3_z|0,0,2/3)'$

(3) $3^{-'} (0,0,1/3) \ 0,0,z$
 $(3_z^{-1}|0,0,1/3)'$

(4) $2'$ $0,0,z$
 $(2_z|0,0,0)'$

(5) $6^{-'} (0,0,2/3) \ 0,0,z$
 $(6_z^{-1}|0,0,2/3)'$

(6) $6^{+'} (0,0,1/3) \ 0,0,z$
 $(6_z|0,0,1/3)'$

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1'+
6 b $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z+2/3$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+1/3$ [0,0,0]
	(4) \bar{x},\bar{y},z [0,0,0]	(5) $y,\bar{x}+y,z+2/3$ [0,0,0]	(6) $x-y,x,z+1/3$ [0,0,0]
3 a $2..1'$	$0,0,z$ [0,0,0]	$0,0,z+2/3$ [0,0,0]	$0,0,z+1/3$ [0,0,0]

Symmetry of special projections

Along [001] $61'$	Along [100] $\rho 11m1'$ $a^* = c$	Along [210] $\rho 11m1'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

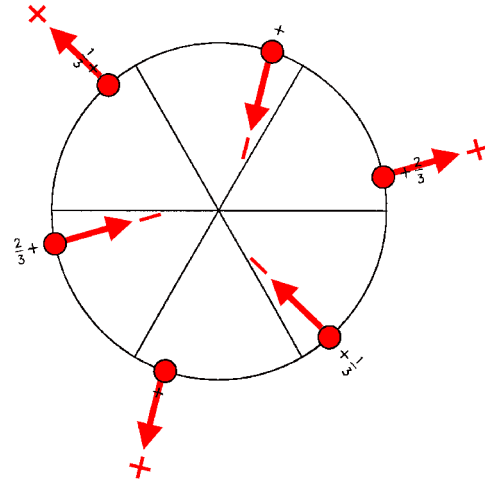
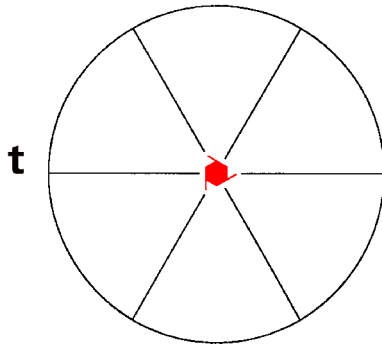
$p6_2'$

No. 55.3.181

$6'$

$p6_2'$

Hexagonal



Origin on $2'$ on $6_2'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,2/3) 0,0,z
(3_z |0,0,2/3)

(3) 3^- (0,0,1/3) 0,0,z
(3_z^{-1} |0,0,1/3)

(4) $2'$ 0,0,z
(2_z |0,0,0)'

(5) 6^+ (0,0,2/3) 0,0,z
(6_z^+ |0,0,2/3)'

(6) 6^{+-} (0,0,1/3) 0,0,z
(6_z^{+-} |0,0,1/3)'

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x, y, z [u, v, w]	(2) $\bar{y}, x-y, z+2/3$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z+1/3$ [$\bar{u}+v, \bar{u}, w$]
6 b 1	(4) \bar{x}, \bar{y}, z [u, v, \bar{w}]	(5) $y, \bar{x}+y, z+2/3$ [$\bar{v}, u-v, \bar{w}$]	(6) $x-y, x, z+1/3$ [$\bar{u}+v, \bar{u}, \bar{w}$]
	3 a 2'..	0,0,z [u,v,0]	0,0,z+2/3 [$\bar{v}, u-v, 0$]
			0,0,z+1/3 [$\bar{u}+v, \bar{u}, 0$]

Symmetry of special projections

Along [001] $6'$	Along [100] $\rho 11m$ $a^* = c$	Along [210] $\rho 11m$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

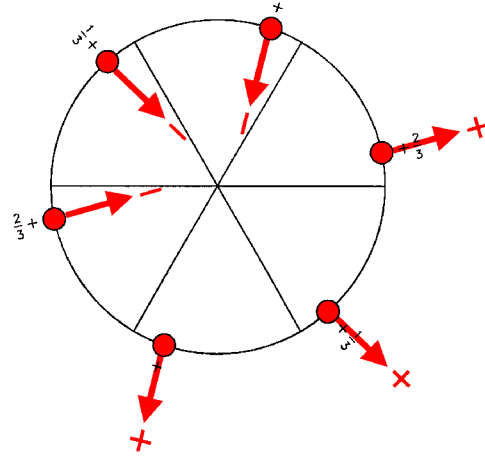
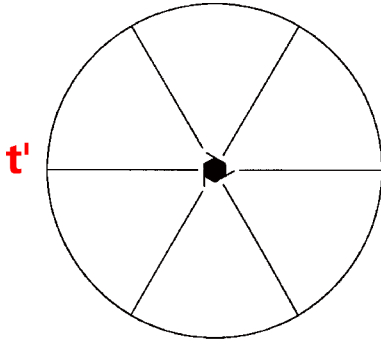
$p_{2c}6_2$

$61'$

Hexagonal

No. 55.4.282

$p_{2c}6_2$



Origin on $2'$ on 6_2

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

For $(0,0,0) +$ set

(1) 1
 $(1|0,0,0)$

(2) $3^+ (0,0,2/3) \ 0,0,z$
 $(3_z|0,0,2/3)$

(3) $3^- (0,0,1/3) \ 0,0,z$
 $(3_z^{-1}|0,0,1/3)'$

(4) $2' \ 0,0,z$
 $(2_z|0,0,0)'$

(5) $6^- (0,0,2/3) \ 0,0,z$
 $(6_z^{-1}|0,0,2/3)'$

(6) $6^+ (0,0,1/3) \ 0,0,z$
 $(6_z|0,0,1/3)$

For $(0,0,1) +$ set

(1) $t' (0,0,1)$
 $(1|0,0,1)'$

(2) $3^+ (0,0,5/3) \ 0,0,z$
 $(3_z|0,0,5/3)'$

(3) $3^- (0,0,4/3) \ 0,0,z$
 $(3_z^{-1}|0,0,4/3)$

(4) $2 (0,0,1) \ 0,0,z$
 $(2_z|0,0,1)$

(5) $6^- (0,0,5/3) \ 0,0,z$
 $(6_z^{-1}|0,0,5/3)$

(6) $6^+ (0,0,4/3) \ 0,0,z$
 $(6_z|0,0,4/3)'$

Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
6 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z+2/3 [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z+1/3 [u-v,u,\bar{w}]$
	(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z+2/3 [\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z+1/3 [u-v,u,w]$
3 a 2'..	0,0,z [u,v,0]	0,0,z+2/3 [$\bar{v},u-v,0$]	0,0,z+1/3 [u-v,u,0]

Symmetry of special projections

Along [001] 61'	Along [100] $\rho_{2a^*} 11m'$ $a^* = c$	Along [210] $\rho_{2a^*} 11m'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

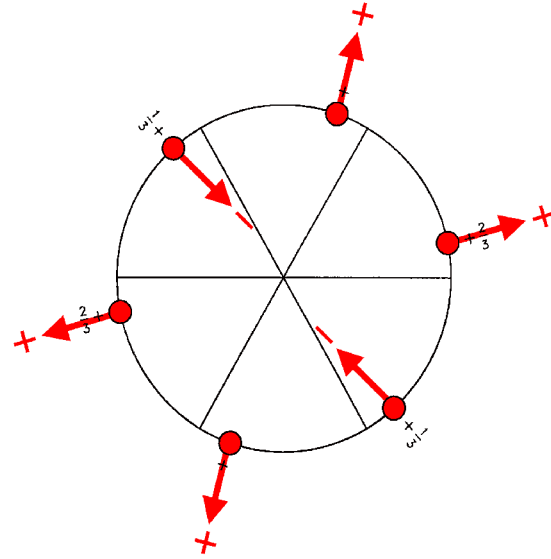
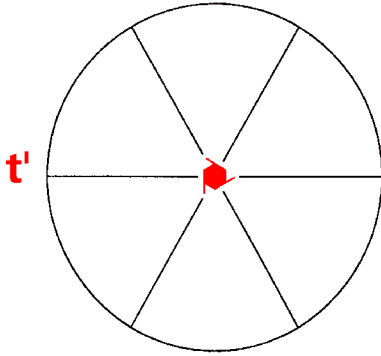
$P_{2c}6_2'$

6

Hexagonal

No. 55.5.283

$P_{2c}6_2'$



Origin on 2 on $6_2'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

For $(0,0,0)$ + set

- | | | |
|--------------------------------|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,2/3) 0,0,z
(3_z 0,0,2/3) | (3) 3^- (0,0,1/3) 0,0,z
(3_z^{-1} 0,0,1/3)' |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- (0,0,2/3) 0,0,z
(6_z^{-1} 0,0,2/3) | (6) 6^{+-} (0,0,1/3) 0,0,z
(6_z 0,0,1/3)' |

For $(0,0,1)$ + set

- | | | |
|--|--|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 3^{+-} (0,0,5/3) 0,0,z
(3_z 0,0,5/3)' | (3) 3^- (0,0,4/3) 0,0,z
(3_z^{-1} 0,0,4/3) |
| (4) $2'$ (0,0,1) 0,0,z
(2_z 0,0,1)' | (5) 6^- (0,0,5/3) 0,0,z
(6_z^{-1} 0,0,5/3)' | (6) 6^+ (0,0,4/3) 0,0,z
(6_z 0,0,4/3) |

Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
6 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z+2/3 [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z+1/3 [u-v,u,\bar{w}]$
	(4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z+2/3 [v,\bar{u}+v,w]$	(6) $x-y,x,z+1/3 [\bar{u}+v,\bar{u},\bar{w}]$
3 a 2..	0,0,z [0,0,w]	0,0,z+2/3 [0,0,w]	0,0,z+1/3 [0,0, \bar{w}]

Symmetry of special projections

Along [001] $6'$	Along [100] $p_{2a^*} 11m$ $a^* = c$	Along [210] $p_{2a^*} 11m$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

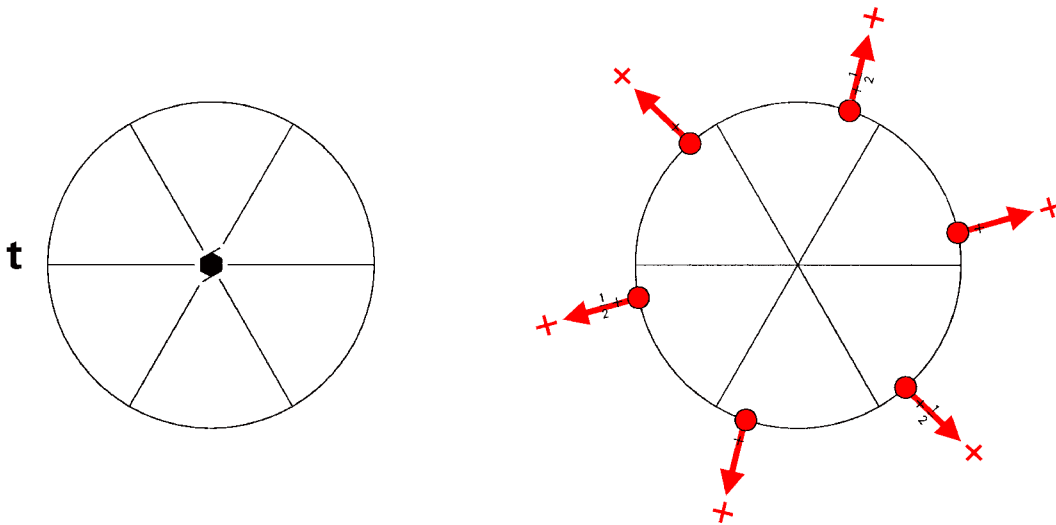
$p6_3$

6

Hexagonal

No. 56.1.284

$p6_3$



Origin on 3 on 6_3

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

$$(1) 1 \\ (1|0,0,0)$$

$$(2) 3^+ 0,0,z \\ (3_z|0,0,0)$$

$$(3) 3^- 0,0,z \\ (3_z^{-1}|0,0,0)$$

$$(4) 2 (0,0,1/2) 0,0,z \\ (2_z|0,0,1/2)$$

$$(5) 6^- (0,0,1/2) 0,0,z \\ (6_z^{-1}|0,0,1/2)$$

$$(6) 6^+ (0,0,1/2) 0,0,z \\ (6_z|0,0,1/2)$$

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 b 1	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/2$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/2$ [$u-v,u,w$]
3 a 3..	$0,0,z$ [$0,0,w$]	$0,0,z+1/2$ [$0,0,w$]	

Symmetry of special projections

Along [001] 6	Along [100] $p11g'$ $a^* = c$	Along [210] $p11g'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

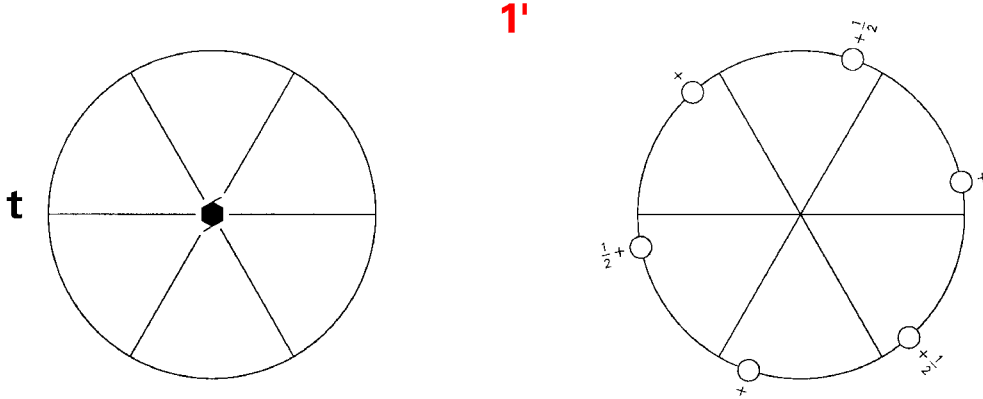
$p6_31'$

$61'$

Hexagonal

No. 56.2.285

$p6_31'$



Origin on $31'$ on $6_31'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

For $1 +$ set

(1) 1
($1|0,0,0$)

(2) 3^+ $0,0,z$
($3_z|0,0,0$)

(3) 3^- $0,0,z$
($3_z^{-1}|0,0,0$)

(4) 2 $(0,0,1/2) \ 0,0,z$
($2_z|0,0,1/2$)

(5) 6^- $(0,0,1/2) \ 0,0,z$
($6_z^{-1}|0,0,1/2$)

(6) 6^+ $(0,0,1/2) \ 0,0,z$
($6_z|0,0,1/2$)

For $1' +$ set

(1) $1'$
($1|0,0,0'$)

(2) $3^{+'}$ $0,0,z$
($3_z|0,0,0'$)

(3) $3^{-'}$ $0,0,z$
($3_z^{-1}|0,0,0'$)

(4) $2'$ $(0,0,1/2) \ 0,0,z$
($2_z|0,0,1/2'$)

(5) $6^{-'}$ $(0,0,1/2) \ 0,0,z$
($6_z^{-1}|0,0,1/2'$)

(6) $6^{+'}$ $(0,0,1/2) \ 0,0,z$
($6_z|0,0,1/2'$)

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$1+$	$1' +$
6 b $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $\bar{x},\bar{y},z+1/2 [0,0,0]$	(5) $y,\bar{x}+y,z+1/2 [0,0,0]$	(6) $x-y,x,z+1/2 [0,0,0]$
3 a $3..1'$	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$	

Symmetry of special projections

Along $[001] 61'$	Along $[100] p11g1'$	Along $[210] p11g1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

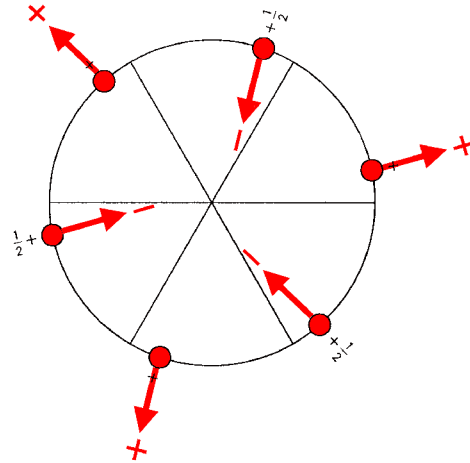
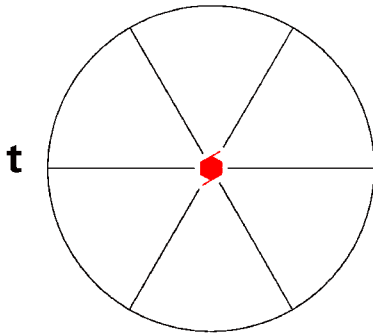
$p6_3'$

No. 56.3.286

$6'$

$p6_3'$

Hexagonal



Origin on 3 on $6_3'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^+ (0,0,1/2) 0,0,z
(6_z^+ 0,0,1/2)' | (6) 6^- (0,0,1/2) 0,0,z
(6_z^- 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 b 1	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	(5) $y,\bar{x}+y,z+1/2$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
3 a 3..	0,0,z [0,0,w]	0,0,z+1/2 [0,0, \bar{w}]	

Symmetry of special projections

Along [001] $6'$	Along [100] $\rho 11g$ $a^* = c$	Along [210] $\rho 11g$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

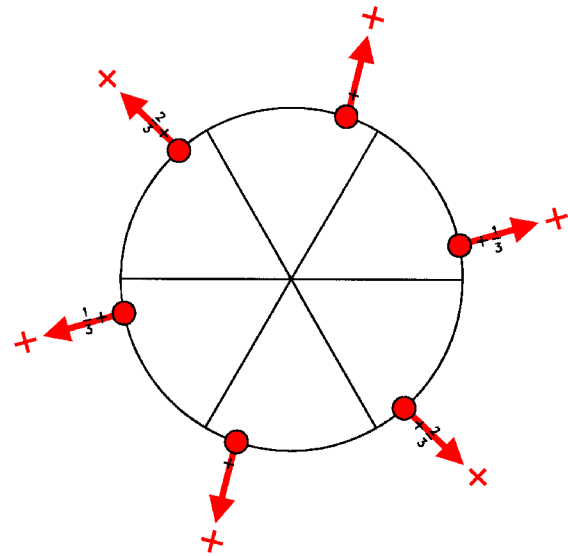
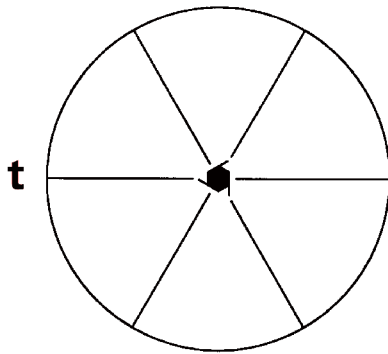
$p6_4$

6

Hexagonal

No. 57.1.287

$p6_4$



Origin on 2 on 6_4

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,1/3) 0,0,z
(3_z |0,0,1/3)

(3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} |0,0,2/3)

(4) 2 0,0,z
(2_z |0,0,0)

(5) 6^- (0,0,1/3) 0,0,z
(6_z^{-1} |0,0,1/3)

(6) 6^+ (0,0,2/3) 0,0,z
(6_z |0,0,2/3)

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]
6 b 1	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/3$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+2/3$ [$u-v,u,w$]
	3 a 2..	$0,0,z$ [$0,0,w$]	$0,0,z+1/3$ [$0,0,w$]
			$0,0,z+2/3$ [$0,0,w$]

Symmetry of special projections

Along [001] 6	Along [100] $p11m'$ $a^* = c$	Along [210] $p11m'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

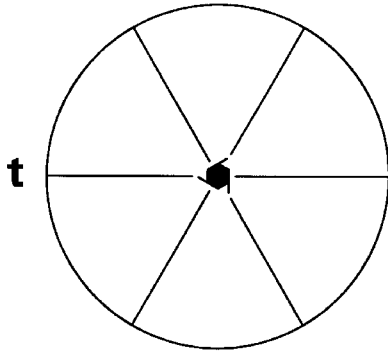
$p6_41'$

$61'$

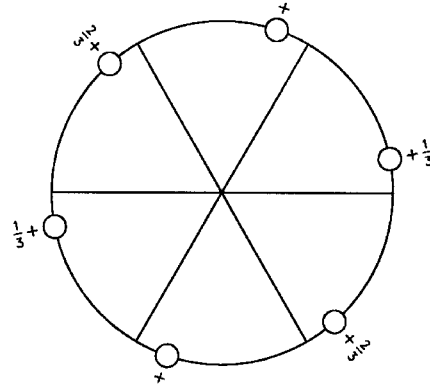
Hexagonal

No. 57.2.288

$p6_41'$



$1'$



Origin on $21'$ on $6_41'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

For $1 +$ set

$$(1) 1 \\ (1|0,0,0)$$

$$(2) 3^+ (0,0,1/3) \ 0,0,z \\ (3_z|0,0,1/3)$$

$$(3) 3^- (0,0,2/3) \ 0,0,z \\ (3_z^{-1}|0,0,2/3)$$

$$(4) 2 \ 0,0,z \\ (2_z|0,0,0)$$

$$(5) 6^- (0,0,1/3) \ 0,0,z \\ (6_z^{-1}|0,0,1/3)$$

$$(6) 6^+ (0,0,2/3) \ 0,0,z \\ (6_z|0,0,2/3)$$

For $1' +$ set

$$(1) 1' \\ (1|0,0,0)'$$

$$(2) 3^{+'} (0,0,1/3) \ 0,0,z \\ (3_z|0,0,1/3)'$$

$$(3) 3^{-'} (0,0,2/3) \ 0,0,z \\ (3_z^{-1}|0,0,2/3)'$$

$$(4) 2' \ 0,0,z \\ (2_z|0,0,0)'$$

$$(5) 6^{-'} (0,0,1/3) \ 0,0,z \\ (6_z^{-1}|0,0,1/3)'$$

$$(6) 6^{+'} (0,0,2/3) \ 0,0,z \\ (6_z|0,0,2/3)'$$

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$1+$	$1' +$
6 b $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z+1/3$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+2/3$ [0,0,0]
	(4) \bar{x},\bar{y},z [0,0,0]	(5) $y,\bar{x}+y,z+1/3$ [0,0,0]	(6) $x-y,x,z+2/3$ [0,0,0]
3 a $2..1'$	$0,0,z$ [0,0,0]	$0,0,z+1/3$ [0,0,0]	$0,0,z+2/3$ [0,0,0]

Symmetry of special projections

Along [001] $61'$	Along [100] $p11m1'$ $a^* = c$	Along [210] $p11m1'$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

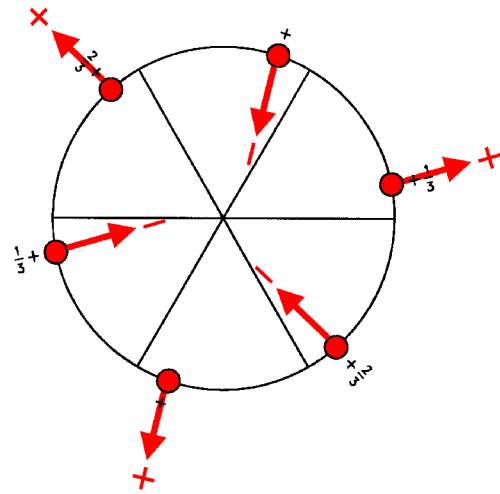
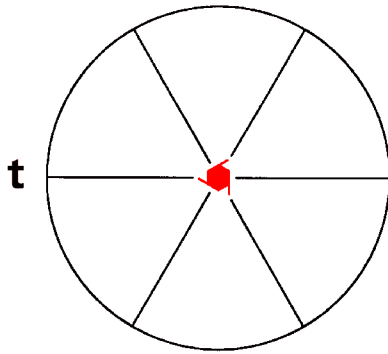
$p6_4'$

No. 57.3.289

$6'$

$p6_4'$

Hexagonal



Origin on $2'$ on $6_4'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,1/3) 0,0,z
(3_z |0,0,1/3)

(3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} |0,0,2/3)

(4) $2'$ 0,0,z
(2_z |0,0,0)'

(5) 6^- (0,0,1/3) 0,0,z
(6_z^{-1} |0,0,1/3)'

(6) 6^+ (0,0,2/3) 0,0,z
(6_z |0,0,2/3)'

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
6 b 1	(1) x, y, z [u, v, w]	(2) $\bar{y}, x-y, z+1/3$ [\bar{v} , u-v, w]	(3) $\bar{x}+y, \bar{x}, z+2/3$ [$\bar{u}+v, \bar{u}, w$]
	(4) \bar{x}, \bar{y}, z [u, v, \bar{w}]	(5) $y, \bar{x}+y, z+1/3$ [\bar{v} , u-v, \bar{w}]	(6) $x-y, x, z+2/3$ [$\bar{u}+v, \bar{u}, \bar{w}$]
3 a 2'..	0,0,z [u, v, 0]	0,0,z+1/3 [\bar{v} , u-v, 0]	0,0,z+2/3 [$\bar{u}+v, \bar{u}, 0$]

Symmetry of special projections

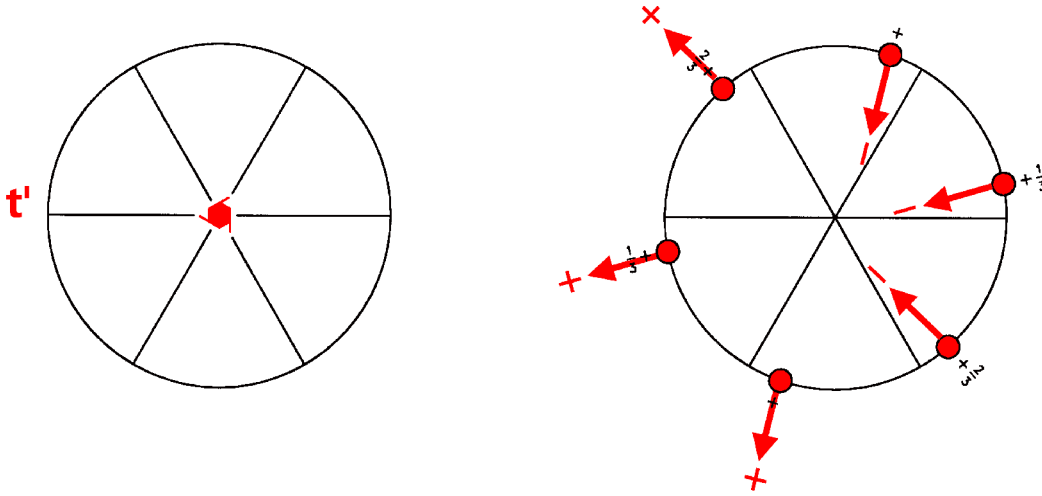
Along [001] 6'	Along [100] $\rho 11m$ $a^* = c$	Along [210] $\rho 11m$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

$P_{2c}6_4'$

No. 57.4.290

 $61'$ $P_{2c}6_4'$

Hexagonal

Origin on $2'$ on $6_4'$ Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$; $y \leq x$

Symmetry operations

For $(0,0,0)$ + set

- | | | |
|--------------------------------------|--|---|
| (1) 1
(1 0,0,0) | (2) 3^{+} $(0,0,1/3)$ $0,0,z$
(3_z^{-1} 0,0,1/3)' | (3) 3^{-} $(0,0,2/3)$ $0,0,z$
(3_z^{-1} 0,0,2/3) |
| (4) $2'$ $0,0,z$
(2_z 0,0,0)' | (5) 6^{-} $(0,0,1/3)$ $0,0,z$
(6_z^{-1} 0,0,1/3) | (6) 6^{+} $(0,0,2/3)$ $0,0,z$
(6_z 0,0,2/3)' |

For $(0,0,1)$ + set

- | | | |
|--|--|--|
| (1) t' $(0,0,1)$
(1 0,0,1)' | (2) 3^{+} $(0,0,4/3)$ $0,0,z$
(3_z 0,0,4/3) | (3) 3^{-} $(0,0,5/3)$ $0,0,z$
(3_z^{-1} 0,0,5/3)' |
| (4) 2 $(0,0,1)$ $0,0,z$
(2_z 0,0,1) | (5) 6^{-} $(0,0,4/3)$ $0,0,z$
(6_z^{-1} 0,0,4/3)' | (6) 6^{+} $(0,0,5/3)$ $0,0,z$
(6_z 0,0,5/3) |

Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(0,0,0)+	(0,0,1)'	
6 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z+1/3 [v,\bar{u}+v,\bar{w}]$	(3) $\bar{x}+y,\bar{x},z+2/3 [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z+1/3 [v,\bar{u}+v,w]$	(6) $x-y,x,z+2/3 [\bar{u}+v,\bar{u},\bar{w}]$
3 a 2'..	$0,0,z [u,v,0]$	$0,0,z+1/3 [v,\bar{u}+v,0]$	$0,0,z+2/3 [\bar{u}+v,\bar{u},0]$

Symmetry of special projections

Along [001] $61'$	Along [100] $p_{2a^*} 11m$ $a^* = c$	Along [210] $p_{2a^*} 11m$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

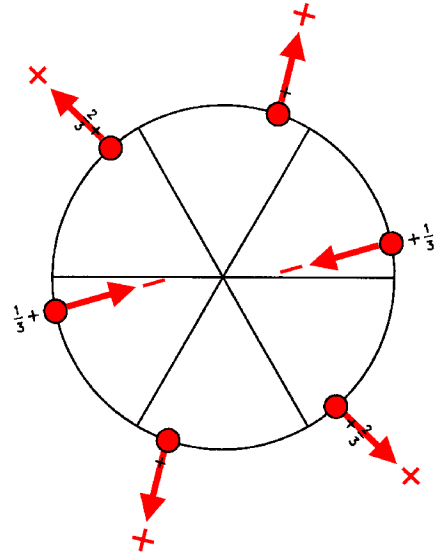
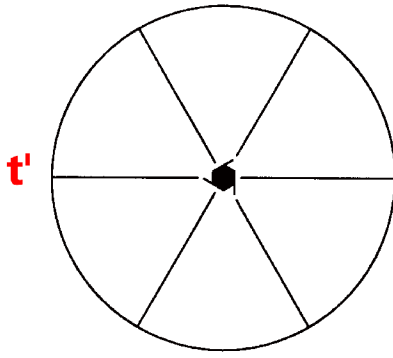
$P_{2c}6_4$

$61'$

Hexagonal

No. 57.5.291

$P_{2c}6_4$



Origin on 2 on 6_4

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x$

Symmetry operations

For $(0,0,0)$ + set

- | | | |
|--------------------------------|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,1/3) 0,0,z
(3_z 0,0,1/3) | (3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} 0,0,2/3) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- (0,0,1/3) 0,0,z
(6_z^{-1} 0,0,1/3) | (6) 6^+ (0,0,2/3) 0,0,z
(6_z 0,0,2/3) |

For $(0,0,1)'$ + set

- | | | |
|--|---|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,4/3) 0,0,z
(3_z 0,0,4/3)' | (3) $3^{-'}$ (0,0,5/3) 0,0,z
(3_z^{-1} 0,0,5/3)' |
| (4) $2'$ (0,0,1) 0,0,z
(2_z 0,0,1)' | (5) $6^{-'}$ (0,0,4/3) 0,0,z
(6_z^{-1} 0,0,4/3)' | (6) $6^{+'}$ (0,0,5/3) 0,0,z
(6_z 0,0,5/3)' |

Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$(0,0,0)+$	$(0,0,1)'+$
6 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z+1/3 [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z+2/3 [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z+1/3 [v,\bar{u}+v,w]$	(6) $x-y,x,z+2/3 [u-v,u,w]$
3 a 2..	$0,0,z [0,0,w]$	$0,0,z+1/3 [0,0,w]$	$0,0,z+2/3 [0,0,w]$

Symmetry of special projections

Along [001] 6	Along [100] $p_{2a^*} 11m'$ $a^* = c$	Along [210] $p_{2a^*} 11m'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

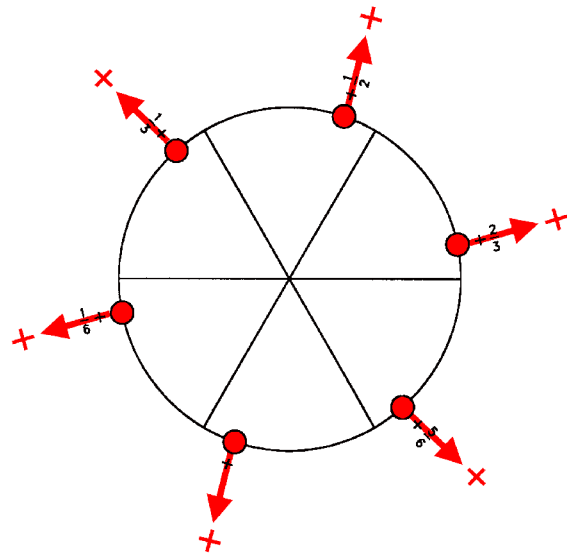
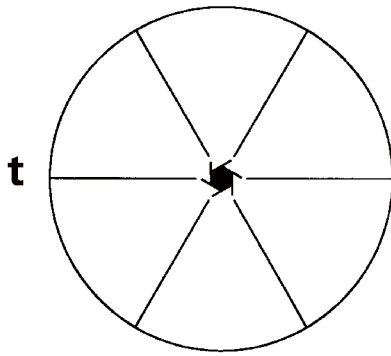
$p6_5$

6

Hexagonal

No. 58.1.292

$p6_5$



Origin on 6_5

Asymmetric unit $0 \leq z \leq 1/6$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ (0,0,2/3) 0,0,z
(3_z |0,0,2/3)

(3) 3^- (0,0,1/3) 0,0,z
(3_z^{-1} |0,0,1/3)

(4) 2 (0,0,1/2) 0,0,z
(2_z |0,0,1/2)

(5) 6^- (0,0,1/6) 0,0,z
(6_z^{-1} |0,0,1/6)

(6) 6^+ (0,0,5/6) 0,0,z
(6_z |0,0,5/6)

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z+2/3$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z+1/3$ [$\bar{u}+v, \bar{u}, w$]
6 a 1	(4) $\bar{x}, \bar{y}, z+1/2$ [\bar{u}, \bar{v}, w]	(5) $y, \bar{x}+y, z+1/6$ [$v, \bar{u}+v, w$]	(6) $x-y, x, z+5/6$ [$u-v, u, w$]

Symmetry of special projections

Along [001] 6	Along [100] $p11g'$ $a^* = c$	Along [210] $p11g'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

$p6_51'$

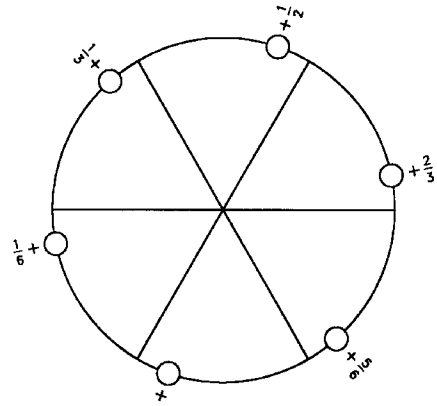
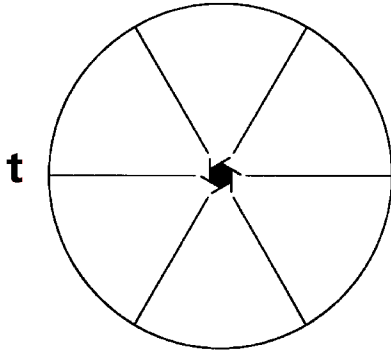
$61'$

Hexagonal

No. 58.2.293

$p6_51'$

1'



Origin on $6_51'$

Asymmetric unit $0 \leq z \leq 1/6$

Symmetry operations

For $1 +$ set

(1) 1
($1|0,0,0$)

(2) 3^+ ($0,0,2/3$) $0,0,z$
($3_z|0,0,2/3$)

(3) 3^- ($0,0,1/3$) $0,0,z$
($3_z^{-1}|0,0,1/3$)

(4) 2 ($0,0,1/2$) $0,0,z$
($2_z|0,0,1/2$)

(5) 6^- ($0,0,1/6$) $0,0,z$
($6_z^{-1}|0,0,1/6$)

(6) 6^+ ($0,0,5/6$) $0,0,z$
($6_z|0,0,5/6$)

For $1' +$ set

(1) $1'$
($1|0,0,0'$)

(2) $3^{+'}$ ($0,0,2/3$) $0,0,z$
($3_z|0,0,2/3'$)

(3) $3^{-'}$ ($0,0,1/3$) $0,0,z$
($3_z^{-1}|0,0,1/3'$)

(4) $2'$ ($0,0,1/2$) $0,0,z$
($2_z|0,0,1/2'$)

(5) $6^{+'}$ ($0,0,1/6$) $0,0,z$
($6_z^{-1}|0,0,1/6'$)

(6) $6^{+'}$ ($0,0,5/6$) $0,0,z$
($6_z|0,0,5/6'$)

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1' +
6 a 11'	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z+2/3$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+1/3$ [0,0,0]
	(4) $\bar{x},\bar{y},z+1/2$ [0,0,0]	(5) $y,\bar{x}+y,z+1/6$ [0,0,0]	(6) $x-y,x,z+5/6$ [0,0,0]

Symmetry of special projections

Along [001] $61'$	Along [100] $\rho 11g1'$	Along [210] $\rho 11g1'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

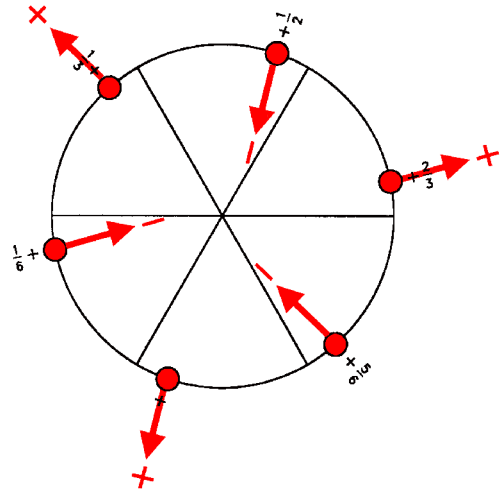
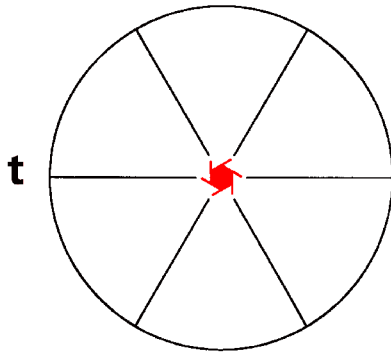
$p6_5'$

No. 58.3.294

$6'$

$p6_5'$

Hexagonal



Origin on $6_5'$

Asymmetric unit $0 \leq z \leq 1/6$

Symmetry operations

$$(1) 1 \\ (1|0,0,0)$$

$$(2) 3^+ (0,0,2/3) \quad 0,0,z \\ (3_z|0,0,2/3)$$

$$(3) 3^- (0,0,1/3) \quad 0,0,z \\ (3_z^{-1}|0,0,1/3)$$

$$(4) 2' (0,0,1/2) \quad 0,0,z \\ (2_z|0,0,1/2)'$$

$$(5) 6^- (0,0,1/6) \quad 0,0,z \\ (6_z^{-1}|0,0,1/6)'$$

$$(6) 6^+ (0,0,5/6) \quad 0,0,z \\ (6_z|0,0,5/6)'$$

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
6 a 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	(5) $y,\bar{x}+y,z+1/6$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+5/6$ [$\bar{u}+v,\bar{u},\bar{w}$]

Symmetry of special projections

Along [001] $6'$	Along [100] $p11g$	Along [210] $p11g$
	$a^* = c$	$a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

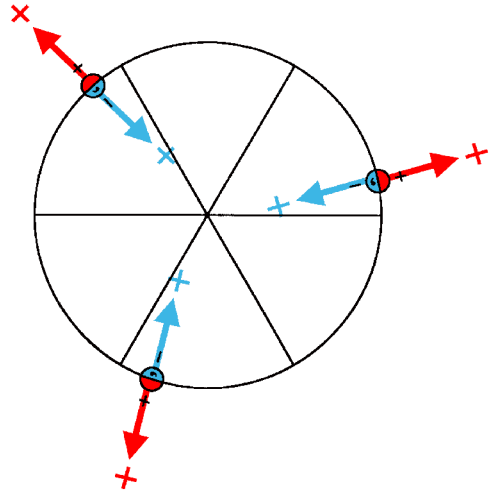
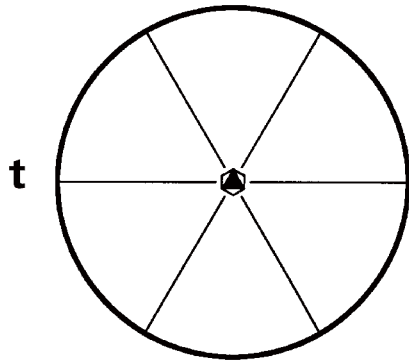
$p\bar{6}$

No. 59.1.295

$\bar{6}$

$p\bar{6}$

Hexagonal



Origin at $\bar{6}$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m x,y,0
(m_z |0,0,0)

(5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ |0,0,0)

(6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ |0,0,0)

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 f 1	(4) x,y,\bar{z} [\bar{u},\bar{v},w]	(5) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$u-v,u,w$]
3 e m..	$x,y,1/2$ [$0,0,w$]	$\bar{y},x-y,1/2$ [$0,0,w$]	$\bar{x}+y,\bar{x},1/2$ [$0,0,w$]
3 d m..	$x,y,0$ [$0,0,w$]	$\bar{y},x-y,0$ [$0,0,w$]	$\bar{x}+y,\bar{x},0$ [$0,0,w$]
2 c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]	
1 b $\bar{6}$..	$0,0,1/2$ [$0,0,w$]		
1 a $\bar{6}$..	$0,0,0$ [$0,0,w$]		

Symmetry of special projections

Along [001] $31'$	Along [100] $p1m1$ $a^* = c$	Along [210] $p1m1$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

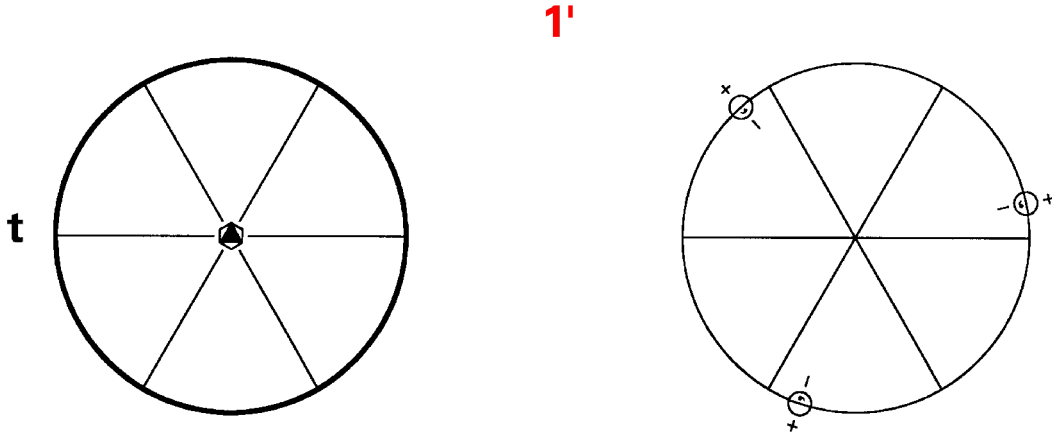
$\bar{p}\bar{6}1'$

No. 59.2.296

$\bar{6}1'$

$\bar{p}\bar{6}1'$

Hexagonal



Origin at $\bar{6}1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $1 +$ set

(1) 1
($1|0,0,0$)

(2) 3^+ $0,0,z$
($3_z|0,0,0$)

(3) 3^- $0,0,z$
($3_z^{-1}|0,0,0$)

(4) m $x,y,0$
($m_z|0,0,0$)

(5) $\bar{6}^-$ $0,0,z; 0,0,0$
($\bar{6}_z^{-1}|0,0,0$)

(6) $\bar{6}^+$ $0,0,z; 0,0,0$
($\bar{6}_z|0,0,0$)

For $1' +$ set

(1) $1'$
($1|0,0,0$)'

(2) $3^{+'}$ $0,0,z$
($3_z|0,0,0$)'

(3) $3^{-'}$ $0,0,z$
($3_z^{-1}|0,0,0$)'

(4) m' $x,y,0$
($m_z|0,0,0$)'

(5) $\bar{6}^{-'}$ $0,0,z; 0,0,0$
($\bar{6}_z^{-1}|0,0,0$)'

(6) $\bar{6}^{+'}$ $0,0,z; 0,0,0$
($\bar{6}_z|0,0,0$)'

Generators selected (1); $t(0,0,1)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1' +$	
6 f $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $x,y,\bar{z} [0,0,0]$	(5) $\bar{y},x-y,\bar{z} [0,0,0]$	(6) $\bar{x}+y,\bar{x},\bar{z} [0,0,0]$
3 e $m..1'$	$x,y,1/2 [0,0,0]$	$\bar{y},x-y,1/2 [0,0,0]$	$\bar{x}+y,\bar{x},1/2 [0,0,0]$
3 d $m..1'$	$x,y,0 [0,0,0]$	$\bar{y},x-y,0 [0,0,0]$	$\bar{x}+y,\bar{x},0 [0,0,0]$
2 c $3..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 b $\bar{6}..1'$	$0,0,1/2 [0,0,0]$		
1 a $\bar{6}..1'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $31'$	Along [100] $p1m11'$	Along [210] $p1m11'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

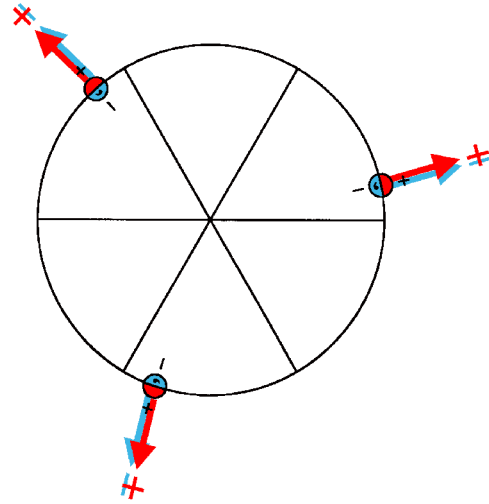
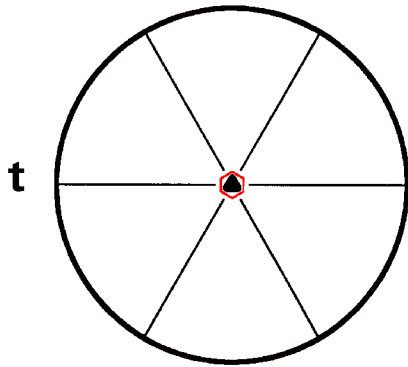
$p\bar{6}'$

No. 59.3.297

$\bar{6}'$

$p\bar{6}'$

Hexagonal



Origin at $\bar{6}'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

$$(1) 1 \\ (1|0,0,0)$$

$$(2) 3^+ \ 0,0,z \\ (3_z|0,0,0)$$

$$(3) 3^- \ 0,0,z \\ (3_z^{-1}|0,0,0)$$

$$(4) m' \ x,y,0 \\ (m_z|0,0,0)'$$

$$(5) \bar{6}' \ 0,0,z; 0,0,0 \\ (\bar{6}_z^{-1}|0,0,0)'$$

$$(6) \bar{6}'^+ \ 0,0,z; 0,0,0 \\ (\bar{6}_z|0,0,0)'$$

Generators selected (1); $t(0,0,1)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 f 1	(4) x,y,\bar{z} [u,v,\bar{w}]	(5) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
3 e $m'..$	$x,y,1/2$ [$u,v,0$]	$\bar{y},x-y,1/2$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/2$ [$\bar{u}+v,\bar{u},0$]
3 d $m'..$	$x,y,0$ [$u,v,0$]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
2 c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	
1 b $\bar{6}^1..$	$0,0,1/2$ [$0,0,0$]		
1 a $\bar{6}^1..$	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

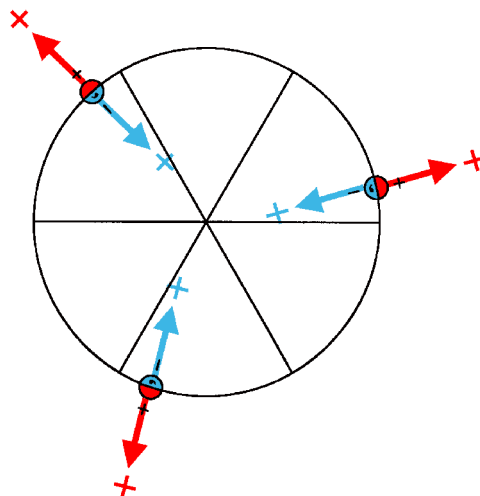
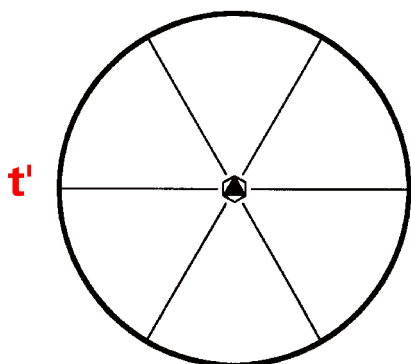
Along [001] 3	Along [100] $p1m'1$ $a^* = c$	Along [210] $p1m'1$ $a^* = c$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

$\rho_{2c}\bar{6}$

No. 59.4.298

 $\bar{6}1'$ $\rho_{2c}\bar{6}$

Hexagonal

Origin at $\bar{6}$ Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m x,y,0
(m_z |0,0,0)

(5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ |0,0,0)

(6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ |0,0,0)

For $(0,0,1)'$ + set

(1) t' (0,0,1)
(1|0,0,1)'

(2) $3^{+'}$ (0,0,1) 0,0,z
(3_z |0,0,1)'

(3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} |0,0,1)'

(4) m' x,y,1/2
(m_z |0,0,1)'

(5) $\bar{6}^{-'}$ 0,0,z; 0,0,1/2
($\bar{6}_z^{-1}$ |0,0,1)'

(6) $\bar{6}^{+'}$ 0,0,z; 0,0,1/2
($\bar{6}_z$ |0,0,1)'

Generators selected (1); $t(0,0,1)'$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
6 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) x,y, \bar{z} [\bar{u},\bar{v},w]	(5) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$u-v,u,w$]
3 e m..	x,y,1/2 [0,0,w]	$\bar{y},x-y,1/2$ [0,0,w]	$\bar{x}+y,\bar{x},1/2$ [0,0,w]
3 d m..	x,y,0 [0,0,w]	$\bar{y},x-y,0$ [0,0,w]	$\bar{x}+y,\bar{x},0$ [0,0,w]
2 c 3..	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]	
1 b $\bar{6}$..	0,0,1/2 [0,0,w]		
1 a $\bar{6}$..	0,0,0 [0,0,w]		

Symmetry of special projections

Along [001] $31'$	Along [100] $\rho_{2a^*} 1m1$ $a^* = c$	Along [210] $\rho_{2a^*} 1m1$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

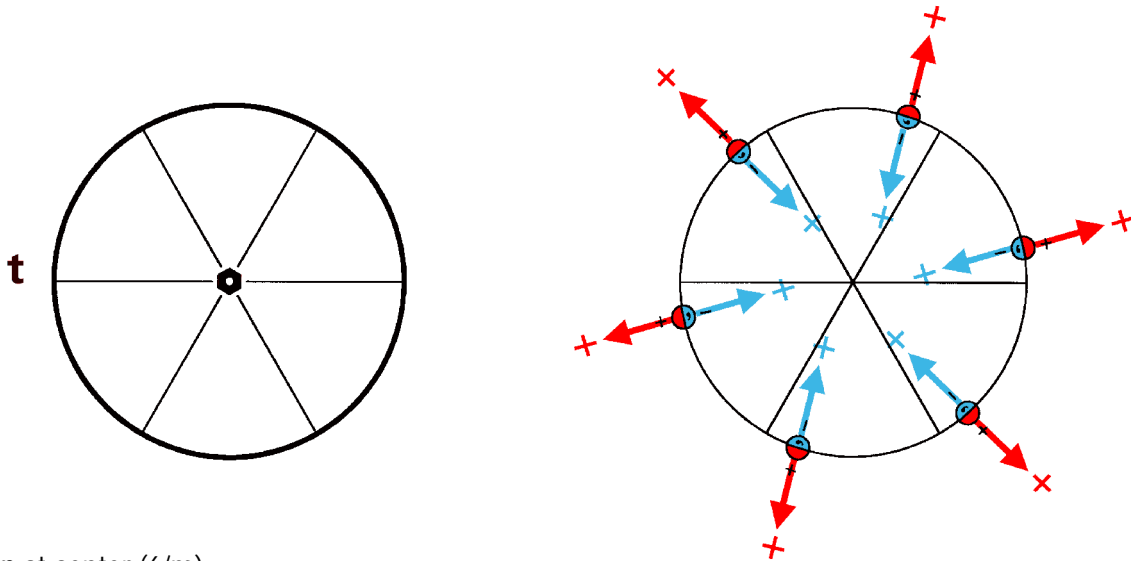
$p6/m$

$6/m$

Hexagonal

No. 60.1.299

$p6/m$



Origin at center ($6/m$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m x,y,0
(m_z 0,0,0) | (11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (12) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) x-y,x,z [u-v,u,w]
	(7) \bar{x},\bar{y},\bar{z} [u,v,w]	(8) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(9) x-y,x, \bar{z} [$\bar{u}+v,\bar{u},w$]
	(10) x,y, \bar{z} [\bar{u},\bar{v},w]	(11) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(12) $\bar{x}+y,\bar{x},\bar{z}$ [u-v,u,w]
6 e m..	x,y,1/2 [0,0,w]	$\bar{y},x-y,1/2$ [0,0,w]	$\bar{x}+y,\bar{x},1/2$ [0,0,w]
	$\bar{x},\bar{y},1/2$ [0,0,w]	y, $\bar{x}+y,1/2$ [0,0,w]	x-y,x,1/2 [0,0,w]
6 d m..	x,y,0 [0,0,w]	$\bar{y},x-y,0$ [0,0,w]	$\bar{x}+y,\bar{x},0$ [0,0,w]
	$\bar{x},\bar{y},0$ [0,0,w]	y, $\bar{x}+y,0$ [0,0,w]	x-y,x,0 [0,0,w]
2 c 6..	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]	
1 b 6/m..	0,0,1/2 [0,0,w]		
1 a 6/m..	0,0,0 [0,0,w]		

Symmetry of special projections

Along [001] 6	Along [100] $p2'mm'$ $\mathbf{a}^* = \mathbf{c}$	Along [210] $p2'mm'$ $\mathbf{a}^* = \mathbf{c}$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

$p6/m1'$

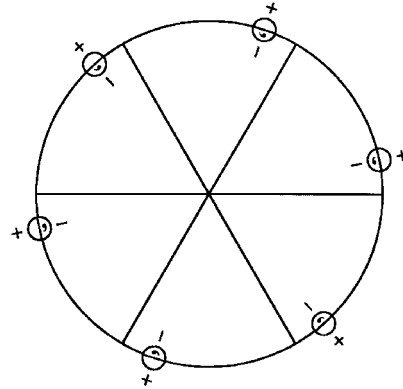
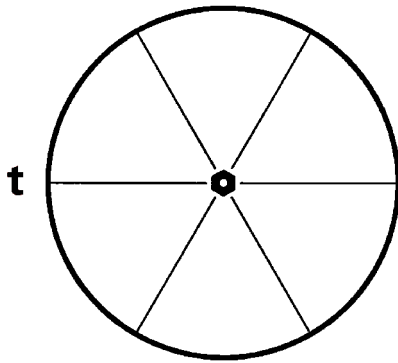
$6/m1'$

Hexagonal

No. 60.2.300

$p6/m1'$

1'



Origin at center ($6/m1'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

For 1 + set

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m x,y,0
(m_z 0,0,0) | (11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (12) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |

For 1' + set

- | | | |
|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) 2' 0,0,z
(2_z 0,0,0)' | (5) $6^{-'}$ 0,0,z
(6_z^{-1} 0,0,0)' | (6) $6^{+'}$ 0,0,z
(6_z 0,0,0)' |
| (7) $\bar{1}'$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^{+'}$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^{-'}$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m' x,y,0
(m_z 0,0,0)' | (11) $\bar{6}^{-'}$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (12) $\bar{6}^{+'}$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1' +$	
12 f $11'$	(1) $x,y,z [0,0,0]$ (4) $\bar{x},\bar{y},z [0,0,0]$ (7) $\bar{x},\bar{y},\bar{z} [0,0,0]$ (10) $x,y,\bar{z} [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$ (5) $y,\bar{x}+y,z [0,0,0]$ (8) $y,\bar{x}+y,\bar{z} [0,0,0]$ (11) $\bar{y},x-y,\bar{z} [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$ (6) $x-y,x,z [0,0,0]$ (9) $x-y,x,\bar{z} [0,0,0]$ (12) $\bar{x}+y,\bar{x},\bar{z} [0,0,0]$
6 e $m..1'$	$x,y,1/2 [0,0,0]$ $\bar{x},\bar{y},1/2 [0,0,0]$	$\bar{y},x-y,1/2 [0,0,0]$ $y,\bar{x}+y,1/2 [0,0,0]$	$\bar{x}+y,\bar{x},1/2 [0,0,0]$ $x-y,x,1/2 [0,0,0]$
6 d $m..1'$	$x,y,0 [0,0,0]$ $\bar{x},\bar{y},0 [0,0,0]$	$\bar{y},x-y,0 [0,0,0]$ $y,\bar{x}+y,0 [0,0,0]$	$\bar{x}+y,\bar{x},0 [0,0,0]$ $x-y,x,0 [0,0,0]$
2 c $6..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 b $6/m..1'$	$0,0,1/2 [0,0,0]$		
1 a $6/m..1'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $61'$	Along [100] $p2mm1'$	Along [210] $p2mm1'$
Origin at $0,0,z$	$\mathbf{a}^* = \mathbf{c}$ Origin at $x,0,0$	$\mathbf{a}^* = \mathbf{c}$ Origin at $x,x/2,0$

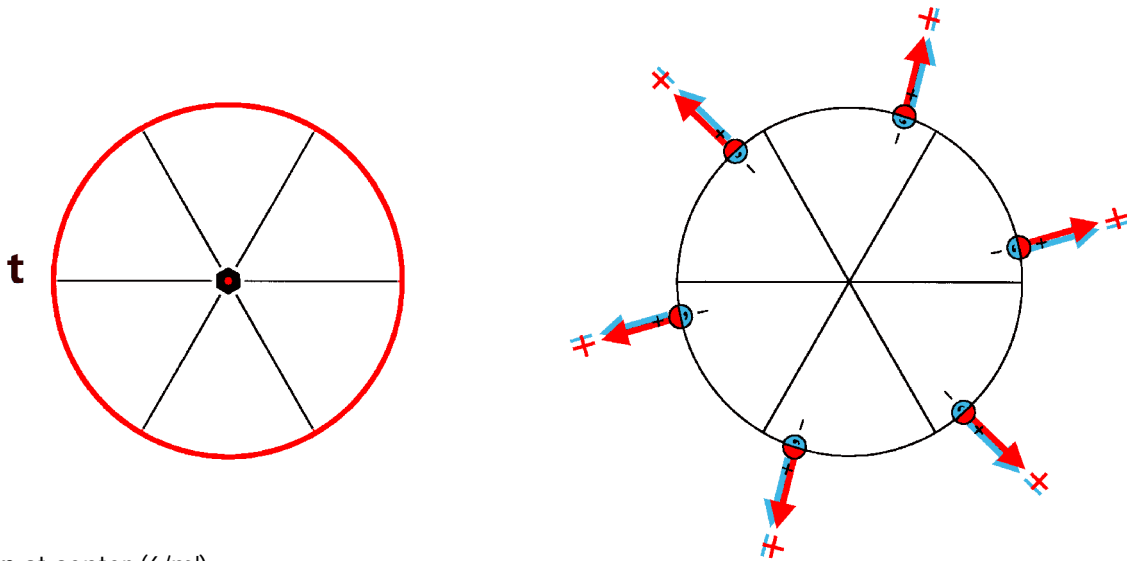
$p6/m'$

$6/m'$

Hexagonal

No. 60.3.301

$p6/m'$



Origin at center ($6/m'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m' x,y,0
(m_z 0,0,0)' | (11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (12) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

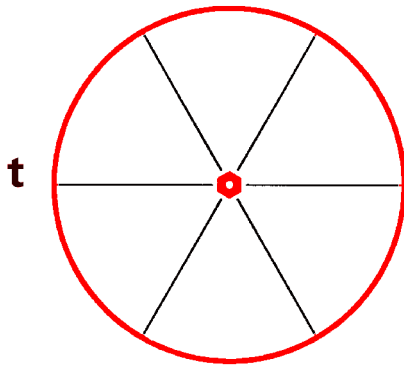
	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z$ [u-v,u,w]
	(7) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(8) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(9) $x-y,x,\bar{z}$ [u-v,u, \bar{w}]
	(10) x,y,\bar{z} [u,v, \bar{w}]	(11) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(12) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
6 e m' ..	$x,y,1/2$ [u,v,0]	$\bar{y},x-y,1/2$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/2$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]	$y,\bar{x}+y,1/2$ [$v,\bar{u}+v,0$]	$x-y,x,1/2$ [u-v,u,0]
6 d m' ..	$x,y,0$ [u,v,0]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$y,\bar{x}+y,0$ [$v,\bar{u}+v,0$]	$x-y,x,0$ [u-v,u,0]
2 c 6..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]	
1 b $6/m'$..	$0,0,1/2$ [0,0,0]		
1 a $6/m'$..	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $61'$	Along [100] $p2m'm'$	Along [210] $p2m'm'$
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}$ Origin at x,x/2,0

$p6'/m'$

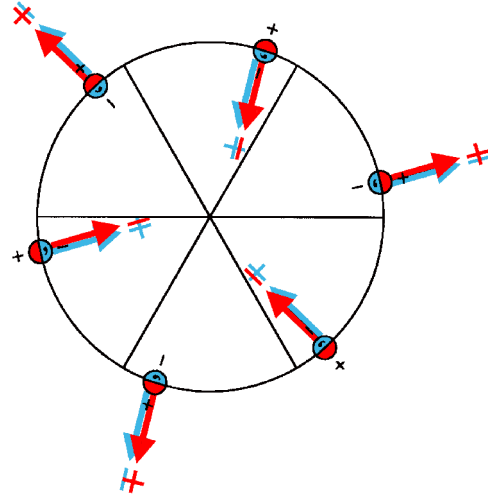
No. 60.4.302



$6'/m'$

$p6'/m'$

Hexagonal



Origin at center ($6'/m'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

- | | | |
|--|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^+ 0,0,z
(6_z^+ 0,0,0)' | (6) 6^{+} 0,0,z
(6_z 0,0,0)' |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m' x,y,0
(m_z 0,0,0)' | (11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (12) $\bar{6}^{+}$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v, \bar{w}]	(5) $y,\bar{x}+y,z$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) \bar{x},\bar{y},\bar{z} [u,v,w]	(8) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(9) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]
	(10) x,y,\bar{z} [u,v, \bar{w}]	(11) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(12) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
6 e $m'..$	$x,y,1/2$ [u,v,0]	$\bar{y},x-y,1/2$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/2$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},1/2$ [u,v,0]	$y,\bar{x}+y,1/2$ [$\bar{v},u-v,0$]	$x-y,x,1/2$ [$\bar{u}+v,\bar{u},0$]
6 d $m'..$	$x,y,0$ [u,v,0]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},0$ [u,v,0]	$y,\bar{x}+y,0$ [$\bar{v},u-v,0$]	$x-y,x,0$ [$\bar{u}+v,\bar{u},0$]
2 c $6'..$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
1 b $6'/m'..$	$0,0,1/2$ [0,0,0]		
1 a $6'/m'..$	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $61'$	Along [100] $\rho 2'm'm$ $\mathbf{a}^* = \mathbf{c}$	Along [210] $\rho 2'm'm$ $\mathbf{a}^* = \mathbf{c}$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

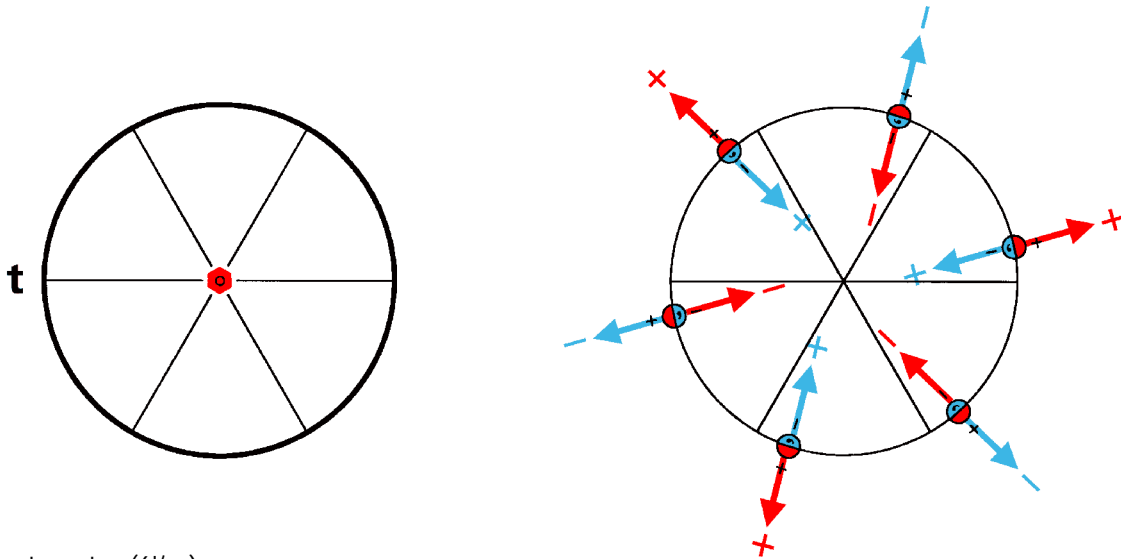
$p6'/m$

No. 60.5.303

$6'/m$

$p6'/m$

Hexagonal



Origin at center ($6'/m$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m x,y,0
(m_z 0,0,0) | (11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (12) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v,\bar{w}]	(5) $y,\bar{x}+y,z$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(8) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(9) $x-y,x,\bar{z}$ [$u-v,u,\bar{w}$]
	(10) x,y,\bar{z} [\bar{v},\bar{u},w]	(11) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(12) $\bar{x}+y,\bar{x},\bar{z}$ [$u-v,u,w$]
6 e m..	$x,y,1/2$ [$0,0,w$]	$\bar{y},x-y,1/2$ [$0,0,w$]	$\bar{x}+y,\bar{x},1/2$ [$0,0,w$]
	$\bar{x},\bar{y},1/2$ [$0,0,\bar{w}$]	$y,\bar{x}+y,1/2$ [$0,0,\bar{w}$]	$x-y,x,1/2$ [$0,0,\bar{w}$]
6 d m..	$x,y,0$ [$0,0,w$]	$\bar{y},x-y,0$ [$0,0,w$]	$\bar{x}+y,\bar{x},0$ [$0,0,w$]
	$\bar{x},\bar{y},0$ [$0,0,\bar{w}$]	$y,\bar{x}+y,0$ [$0,0,\bar{w}$]	$x-y,x,0$ [$0,0,\bar{w}$]
2 c 6'..	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	
1 b 6'/m..	$0,0,1/2$ [$0,0,0$]		
1 a 6'/m..	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] 6'	Along [100] $p2mm$ $\mathbf{a}^* = \mathbf{c}$	Along [210] $p2mm$ $\mathbf{a}^* = \mathbf{c}$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

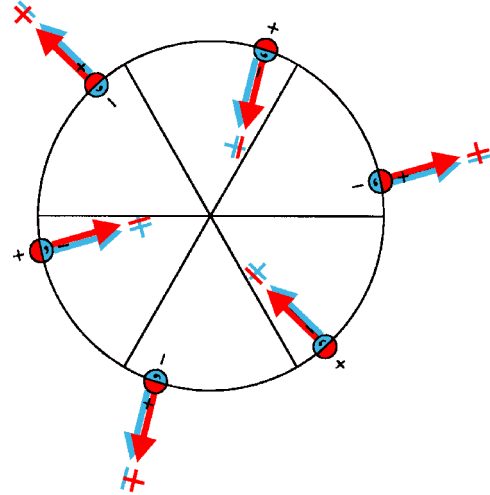
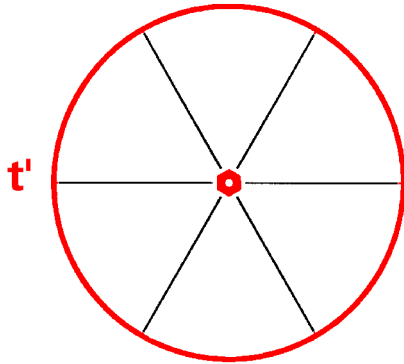
$\rho_{2c} 6'/m'$

$6/m1'$

Hexagonal

No. 60.6.304

$\rho_{2c} 6'/m'$



Origin at center ($6'/m'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

For (0,0,0) + set

- | | | |
|--|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m' x,y,0
(m_z 0,0,0)' | (11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (12) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |

For (0,0,1)' + set

- | | | |
|--|--|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) $2'$ (0,0,1) 0,0,z
(2_z 0,0,1) | (5) $6^{-'}$ (0,0,1) 0,0,z
(6_z^{-1} 0,0,1) | (6) $6^{+'}$ (0,0,1) 0,0,z
(6_z 0,0,1) |
| (7) $\bar{1}'$ 0,0,1/2
($\bar{1}$ 0,0,1)' | (8) $\bar{3}^{+'}$ 0,0,z; 0,0,1/2
($\bar{3}_z$ 0,0,1)' | (9) $\bar{3}^{-'}$ 0,0,z; 0,0,1/2
($\bar{3}_z^{-1}$ 0,0,1)' |
| (10) m' x,y,1/2
(m_z 0,0,1) | (11) $\bar{6}^{-'}$ 0,0,z; 0,0,1/2
($\bar{6}_z^{-1}$ 0,0,1) | (12) $\bar{6}^{+'}$ 0,0,z; 0,0,1/2
($\bar{6}_z$ 0,0,1) |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
12 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z [\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(8) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$	(9) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$
	(10) $x,y,\bar{z} [u,v,\bar{w}]$	(11) $\bar{y},x-y,\bar{z} [\bar{v},u-v,\bar{w}]$	(12) $\bar{x}+y,\bar{x},\bar{z} [\bar{u}+v,\bar{u},\bar{w}]$
6 e m..	$x,y,1/2 [0,0,w]$	$\bar{y},x-y,1/2 [0,0,w]$	$\bar{x}+y,\bar{x},1/2 [0,0,w]$
	$\bar{x},\bar{y},1/2 [0,0,\bar{w}]$	$y,\bar{x}+y,1/2 [0,0,\bar{w}]$	$x-y,x,1/2 [0,0,\bar{w}]$
6 d m'..	$x,y,0 [u,v,0]$	$\bar{y},x-y,0 [\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},0 [\bar{u}+v,\bar{u},0]$
	$\bar{x},\bar{y},0 [u,v,0]$	$y,\bar{x}+y,0 [\bar{v},u-v,0]$	$x-y,x,0 [\bar{u}+v,\bar{u},0]$
2 c 6..	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 b 6'/m..	$0,0,1/2 [0,0,0]$		
1 a 6'/m'..	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $61'$	Along [100] $p_{2a^*} 2'm'm$ $\mathbf{a}^* = \mathbf{c}$	Along [210] $p_{2a^*} 2'm'm$ $\mathbf{a}^* = \mathbf{c}$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

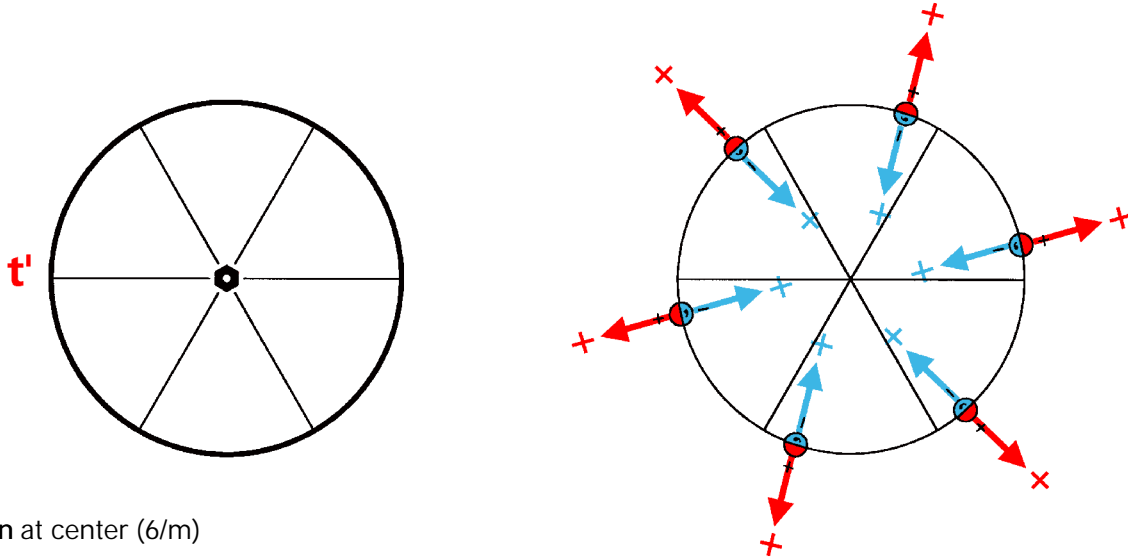
$p_{2c}6/m$

$6/m1'$

Hexagonal

No. 60.7.305

$p_{2c}6/m$



Origin at center ($6/m$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

For $(0,0,0)$ + set

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m x,y,0
(m_z 0,0,0) | (11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (12) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |

For $(0,0,1)'$ + set

- | | | |
|--|---|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) $2'$ (0,0,1) 0,0,z
(2_z 0,0,1)' | (5) $6^{-'}$ (0,0,1) 0,0,z
(6_z^{-1} 0,0,1)' | (6) $6^{+'}$ (0,0,1) 0,0,z
(6_z 0,0,1)' |
| (7) $\bar{1}'$ 0,0,1/2
($\bar{1}$ 0,0,1)' | (8) $\bar{3}^{+'}$ 0,0,z; 0,0,1/2
($\bar{3}_z$ 0,0,1)' | (9) $\bar{3}^{-'}$ 0,0,z; 0,0,1/2
($\bar{3}_z^{-1}$ 0,0,1)' |
| (10) m' x,y,1/2
(m_z 0,0,1)' | (11) $\bar{6}^{-'}$ 0,0,z; 0,0,1/2
($\bar{6}_z^{-1}$ 0,0,1)' | (12) $\bar{6}^{+'}$ 0,0,z; 0,0,1/2
($\bar{6}_z$ 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(0,0,0)+	(0,0,1)' +	
12 f 1	(1) $x,y,z [u,v,w]$ (4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$ (7) $\bar{x},\bar{y},\bar{z} [u,v,w]$ (10) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$ (5) $y,\bar{x}+y,z [v,\bar{u}+v,w]$ (8) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$ (11) $\bar{y},x-y,\bar{z} [v,\bar{u}+v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$ (6) $x-y,x,z [u-v,u,w]$ (9) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$ (12) $\bar{x}+y,\bar{x},\bar{z} [u-v,u,w]$
6 e $m'..$	$x,y,1/2 [u,v,0]$ $\bar{x},\bar{y},1/2 [\bar{u},\bar{v},0]$	$\bar{y},x-y,1/2 [\bar{v},u-v,0]$ $y,\bar{x}+y,1/2 [v,\bar{u}+v,0]$	$\bar{x}+y,\bar{x},1/2 [\bar{u}+v,\bar{u},0]$ $x-y,x,1/2 [u-v,u,0]$
6 d $m..$	$x,y,0 [0,0,w]$ $\bar{x},\bar{y},0 [0,0,w]$	$\bar{y},x-y,0 [0,0,w]$ $y,\bar{x}+y,0 [0,0,w]$	$\bar{x}+y,\bar{x},0 [0,0,w]$ $x-y,x,0 [0,0,w]$
2 c $6..$	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$	
1 b $6/m'..$	$0,0,1/2 [0,0,0]$		
1 a $6/m..$	$0,0,0 [0,0,w]$		

Symmetry of special projections

Along [001] $61'$	Along [100] $p_{2a^*} 2'mm'$ $\mathbf{a}^* = \mathbf{c}$	Along [210] $p_{2a^*} 2'mm'$ $\mathbf{a}^* = \mathbf{c}$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

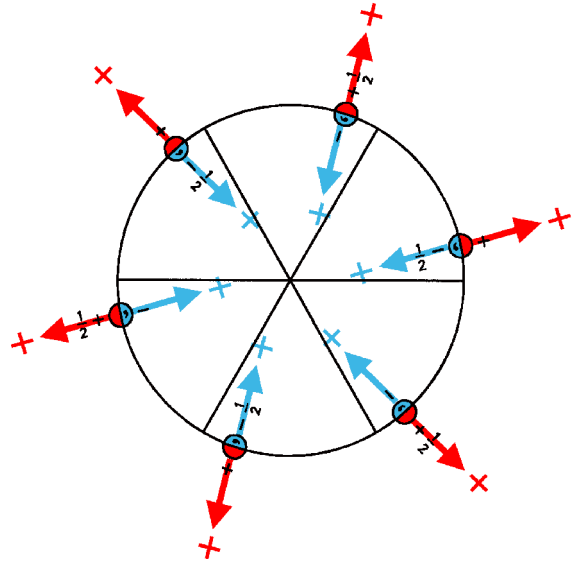
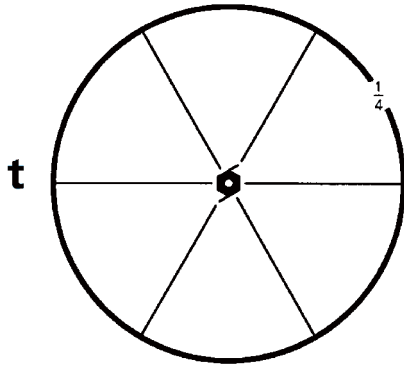
$p6_3/m$

$6/m$

Hexagonal

No. 61.1.306

$p6_3/m$



Origin at center ($\bar{3}$) on 6_3

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|--|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^+ (0,0,1/2) 0,0,z
(6_z^+ 0,0,1/2) | (6) 6^- (0,0,1/2) 0,0,z
(6_z^- 0,0,1/2) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z^+$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^-$ 0,0,0) |
| (10) m x,y,1/4
(m_z 0,0,1/2) | (11) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^-$ 0,0,1/2) | (12) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z^+$ 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 e 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/2$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/2$ [$u-v,u,w$]
	(7) \bar{x},\bar{y},\bar{z} [u,v,w]	(8) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(9) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]
	(10) $x,y,\bar{z}+1/2$ [\bar{u},\bar{v},w]	(11) $\bar{y},x-y,\bar{z}+1/2$ [$v,\bar{u}+v,w$]	(12) $\bar{x}+y,\bar{x},\bar{z}+1/2$ [$u-v,u,w$]
6 d m..	$x,y,1/4$ [0,0,w]	$\bar{y},x-y,1/4$ [0,0,w]	$\bar{x}+y,\bar{x},1/4$ [0,0,w]
	$\bar{x},\bar{y},3/4$ [0,0,w]	$y,\bar{x}+y,3/4$ [0,0,w]	$x-y,x,3/4$ [0,0,w]
4 c 3..	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0,w]	
	$0,0,\bar{z}$ [0,0,w]	$0,0,\bar{z}+1/2$ [0,0,w]	
2 b $\bar{3}$..	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0,w]	
2 a $\bar{6}$..	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0,w]	

Symmetry of special projections

Along [001] 6	Along [100] $\rho 2'mg'$ $\mathbf{a}^* = \mathbf{c}$	Along [210] $\rho 2'mg'$ $\mathbf{a}^* = \mathbf{c}$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

$p6_3/m1'$

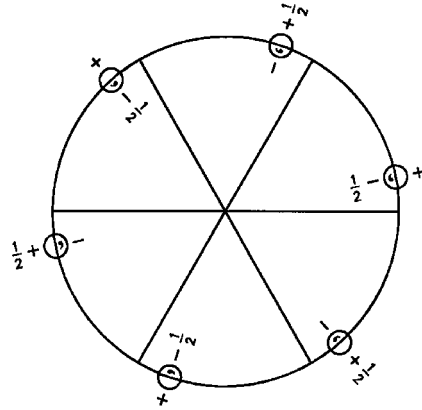
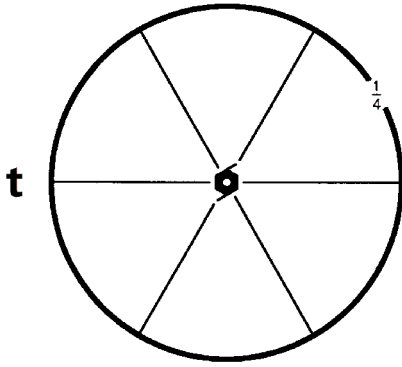
$6/m1'$

Hexagonal

No. 61.2.307

$p6_3/m1'$

1'



Origin at center ($\bar{3}1'$) on $6_31'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

For 1 + set

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m x,y,1/4
(m_z 0,0,1/2) | (11) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2) | (12) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2) |

For 1' + set

- | | | |
|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) 2' (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) $6^{-'}$ (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) $6^{+'}$ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) $\bar{1}'$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^{+'}$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^{-'}$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m' x,y,1/4
(m_z 0,0,1/2)' | (11) $\bar{6}^{-'}$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2)' | (12) $\bar{6}^{+'}$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$1+$	$1'+$
12 e $11'$	(1) x,y,z [0,0,0] (4) $\bar{x},\bar{y},z+1/2$ [0,0,0] (7) \bar{x},\bar{y},\bar{z} [0,0,0] (10) $x,y,\bar{z}+1/2$ [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0] (5) $y,\bar{x}+y,z+1/2$ [0,0,0] (8) $y,\bar{x}+y,\bar{z}$ [0,0,0] (11) $\bar{y},x-y,\bar{z}+1/2$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0] (6) $x-y,x,z+1/2$ [0,0,0] (9) $x-y,x,\bar{z}$ [0,0,0] (12) $\bar{x}+y,\bar{x},\bar{z}+1/2$ [0,0,0]
6 d $m..1'$	$x,y,1/4$ [0,0,0] $\bar{x},\bar{y},3/4$ [0,0,0]	$\bar{y},x-y,1/4$ [0,0,0] $y,\bar{x}+y,3/4$ [0,0,0]	$\bar{x}+y,\bar{x},1/4$ [0,0,0] $x-y,x,3/4$ [0,0,0]
4 c $3..1'$	$0,0,z$ [0,0,0] $0,0,\bar{z}$ [0,0,0]	$0,0,z+1/2$ [0,0,0] $0,0,\bar{z}+1/2$ [0,0,0]	
2 b $\bar{3}..1'$	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	
2 a $\bar{6}..1'$	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]	

Symmetry of special projections

Along [001] $61'$	Along [100] $p2mg1'$	Along [210] $p2mg1'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

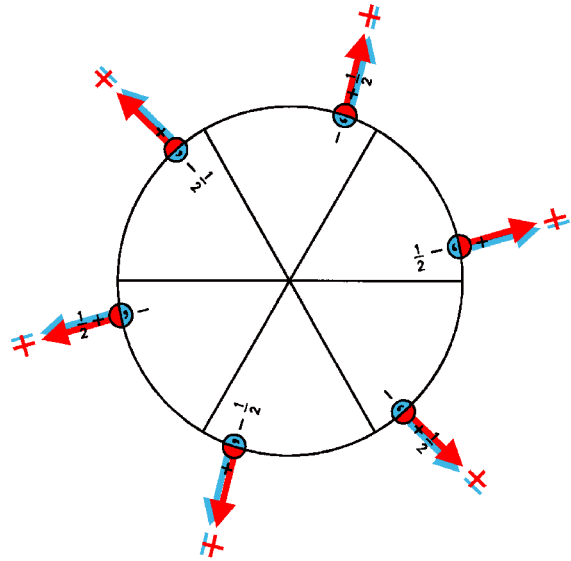
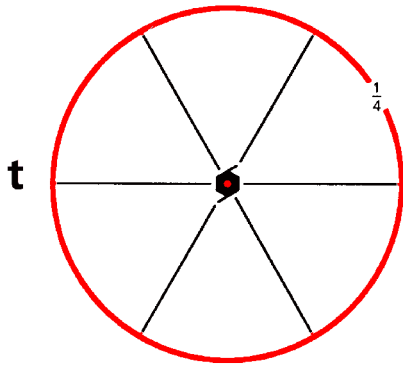
$p6_3/m'$

No. 61.3.308

$6/m'$

$p6_3/m'$

Hexagonal



Origin at center ($\bar{3}$) on 6_3

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m' x,y,1/4
(m_z 0,0,1/2)' | (11) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2)' | (12) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 e 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/2$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/2$ [$u-v,u,w$]
	(7) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(8) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(9) $x-y,x,\bar{z}$ [$u-v,u,\bar{w}$]
	(10) $x,y,\bar{z}+1/2$ [u,v,\bar{w}]	(11) $\bar{y},x-y,\bar{z}+1/2$ [$\bar{v},u-v,\bar{w}$]	(12) $\bar{x}+y,\bar{x},\bar{z}+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
6 d m' ..	$x,y,1/4$ [u,v,0]	$\bar{y},x-y,1/4$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/4$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},3/4$ [$\bar{u},\bar{v},0$]	$y,\bar{x}+y,3/4$ [$v,\bar{u}+v,0$]	$x-y,x,3/4$ [$u-v,u,0$]
4 c 3..	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0,w]	
	$0,0,\bar{z}$ [0,0, \bar{w}]	$0,0,\bar{z}+1/2$ [0,0, \bar{w}]	
2 b $\bar{3}'$..	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	
2 a $\bar{6}'$..	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]	

Symmetry of special projections

Along [001] $61'$	Along [100] $p2m'g'$	Along [210] $p2m'g'$
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}$ Origin at x,x/2,0

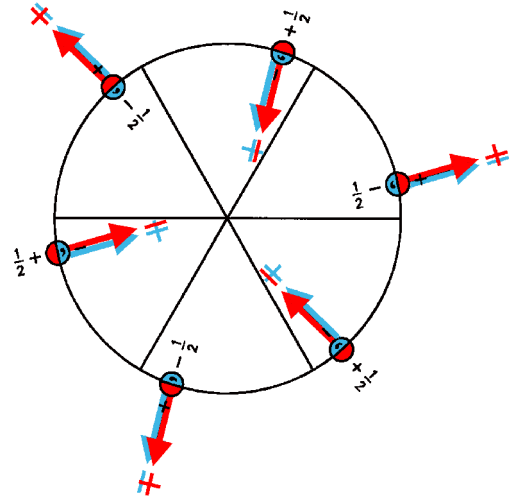
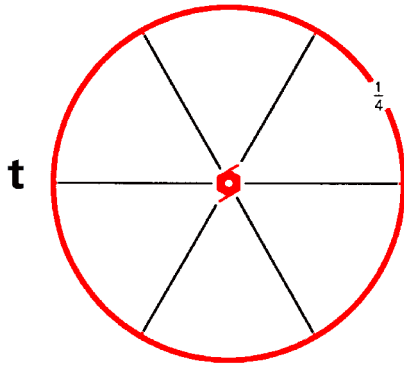
$\rho 6_3'/m'$

$6'/m'$

Hexagonal

No. 61.4.309

$\rho 6_3'/m'$



Origin at center ($\bar{3}$) on $6_3'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m' x,y,1/4
(m_z 0,0,1/2)' | (11) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2)' | (12) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 e 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	(5) $y,\bar{x}+y,z+1/2$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) \bar{x},\bar{y},\bar{z} [u,v,w]	(8) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(9) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]
	(10) $x,y,\bar{z}+1/2$ [u,v, \bar{w}]	(11) $\bar{y},x-y,\bar{z}+1/2$ [$\bar{v},u-v,\bar{w}$]	(12) $\bar{x}+y,\bar{x},\bar{z}+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
6 d m' ..	$x,y,1/4$ [u,v,0]	$\bar{y},x-y,1/4$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/4$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},3/4$ [u,v,0]	$y,\bar{x}+y,3/4$ [$\bar{v},u-v,0$]	$x-y,x,3/4$ [$\bar{u}+v,\bar{u},0$]
4 c 3..	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0, \bar{w}]	
	$0,0,\bar{z}$ [0,0,w]	$0,0,\bar{z}+1/2$ [0,0, \bar{w}]	
2 b $\bar{3}$..	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0, \bar{w}]	
2 a $\bar{6}'$..	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]	

Symmetry of special projections

Along [001] $61'$	Along [100] $p2'm'g$ $a^* = c$	Along [210] $p2'm'g$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

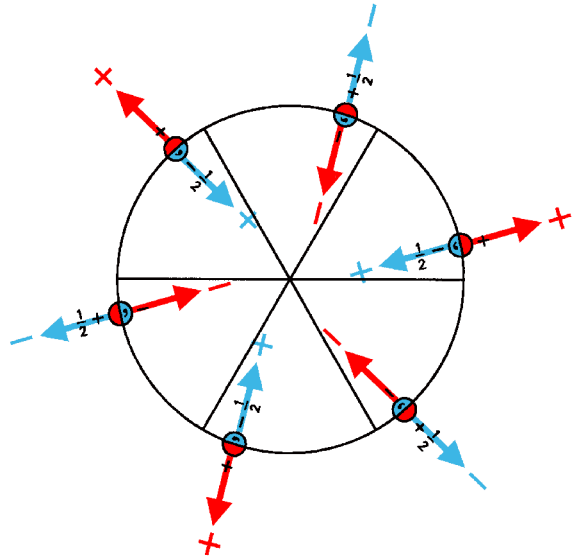
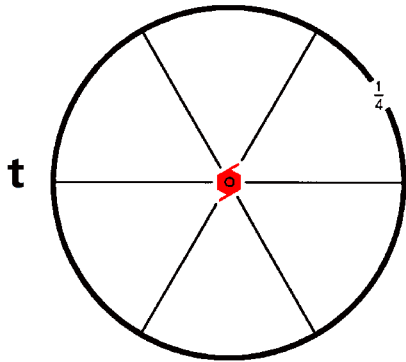
$p6_3'/m$

$6'/m$

Hexagonal

No. 61.5.310

$p6_3'/m$



Origin at center ($\bar{3}$) on $6_3'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) $\bar{1}'$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m x,y,1/4
(m_z 0,0,1/2) | (11) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2) | (12) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 e 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	(5) $y,\bar{x}+y,z+1/2$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(8) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(9) $x-y,x,\bar{z}$ [u-v,u, \bar{w}]
	(10) $x,y,\bar{z}+1/2$ [\bar{u},\bar{v},w]	(11) $\bar{y},x-y,\bar{z}+1/2$ [$v,\bar{u}+v,w$]	(12) $\bar{x}+y,\bar{x},\bar{z}+1/2$ [u-v,u,w]
6 d m..	$x,y,1/4$ [0,0,w]	$\bar{y},x-y,1/4$ [0,0,w]	$\bar{x}+y,\bar{x},1/4$ [0,0,w]
	$\bar{x},\bar{y},3/4$ [0,0, \bar{w}]	$y,\bar{x}+y,3/4$ [0,0, \bar{w}]	$x-y,x,3/4$ [0,0, \bar{w}]
4 c 3..	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0, \bar{w}]	
	$0,0,\bar{z}$ [0,0, \bar{w}]	$0,0,\bar{z}+1/2$ [0,0,w]	
2 b $\bar{3}'..$	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	
2 a $\bar{6}..$	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0, \bar{w}]	

Symmetry of special projections

Along [001] $6'$	Along [100] $p2mg$	Along [210] $p2mg$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,0

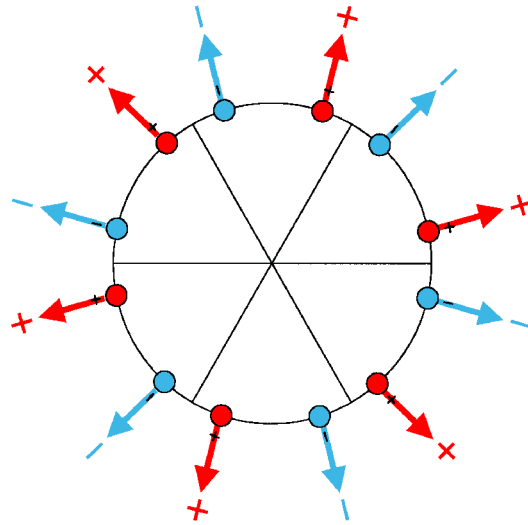
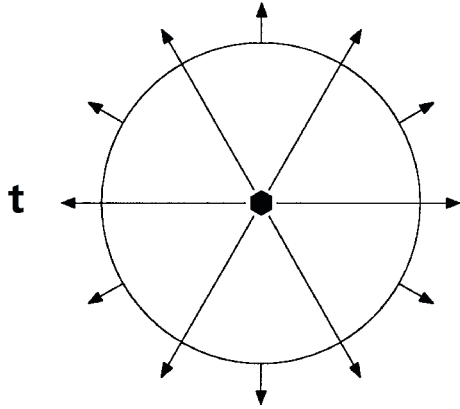
p622

622

Hexagonal

No. 62.1.311

p622



Origin at 622

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) x,y,z $[u,v,w]$	(2) $\bar{y},x-y,z$ $[\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z$ $[\bar{u}+v,\bar{u},w]$
	(4) \bar{x},\bar{y},z $[\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z$ $[v,\bar{u}+v,w]$	(6) $x-y,x,z$ $[u-v,u,w]$
	(7) y,x,\bar{z} $[v,u,\bar{w}]$	(8) $x-y,\bar{y},\bar{z}$ $[u-v,\bar{v},\bar{w}]$	(9) $\bar{x},\bar{x}+y,\bar{z}$ $[\bar{u},\bar{u}+v,\bar{w}]$
	(10) \bar{y},\bar{x},\bar{z} $[\bar{v},\bar{u},\bar{w}]$	(11) $\bar{x}+y,y,\bar{z}$ $[\bar{u}+v,v,\bar{w}]$	(12) $x,x-y,\bar{z}$ $[u,u-v,\bar{w}]$
6 g ..2	$x,\bar{x},1/2$ $[u,\bar{u},0]$	$x,2x,1/2$ $[u,2u,0]$	$2\bar{x},\bar{x},1/2$ $[2\bar{u},\bar{u},0]$
	$\bar{x},x,1/2$ $[\bar{u},u,0]$	$\bar{x},2\bar{x},1/2$ $[\bar{u},2\bar{u},0]$	$2x,x,1/2$ $[2u,u,0]$
6 f ..2	$x,\bar{x},0$ $[u,\bar{u},0]$	$x,2x,0$ $[u,2u,0]$	$2\bar{x},\bar{x},0$ $[2\bar{u},\bar{u},0]$
	$\bar{x},x,0$ $[\bar{u},u,0]$	$\bar{x},2\bar{x},0$ $[\bar{u},2\bar{u},0]$	$2x,x,0$ $[2u,u,0]$
6 e .2.	$x,0,1/2$ $[u,0,0]$	$0,x,1/2$ $[0,u,0]$	$\bar{x},\bar{x},1/2$ $[\bar{u},\bar{u},0]$
	$\bar{x},0,1/2$ $[\bar{u},0,0]$	$0,\bar{x},1/2$ $[0,\bar{u},0]$	$x,x,1/2$ $[u,u,0]$
6 d .2.	$x,0,0$ $[u,0,0]$	$0,x,0$ $[0,u,0]$	$\bar{x},\bar{x},0$ $[\bar{u},\bar{u},0]$
	$\bar{x},0,0$ $[\bar{u},0,0]$	$0,\bar{x},0$ $[0,\bar{u},0]$	$x,x,0$ $[u,u,0]$
2 c 6..	$0,0,z$ $[0,0,w]$	$0,0,\bar{z}$ $[0,0,\bar{w}]$	
1 b 622	$0,0,1/2$ $[0,0,0]$		
1 a 622	$0,0,0$ $[0,0,0]$		

Symmetry of special projectionsAlong [001] $6m'm'$

Origin at 0,0,z

Along [100] $p2m'm'$ $a^* = c$

Origin at x,0,0

Along [210] $p2m'm'$ $a^* = c$

Origin at x,x/2,0

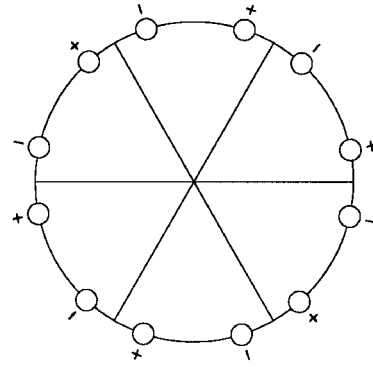
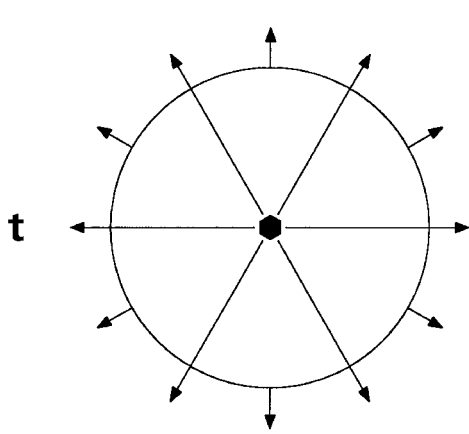
$p6221'$

$6221'$

Hexagonal

No. 62.2.312

$p6221'$



Origin at $6221'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

For 1 + set

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

For 1' + set

- | | | |
|---|---|---|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) 2' 0,0,z
(2_z 0,0,0)' | (5) $6^{-'}$ 0,0,z
(6_z^{-1} 0,0,0)' | (6) $6^{+'}$ 0,0,z
(6_z 0,0,0)' |
| (7) 2' x,x,0
(2_{xy} 0,0,0)' | (8) 2' x,0,0
(2_x 0,0,0)' | (9) 2' 0,y,0
(2_y 0,0,0)' |
| (10) 2' x, \bar{x} ,0
(2_3 0,0,0)' | (11) 2' x,2x,0
(2_2 0,0,0)' | (12) 2' 2x,x,0
(2_1 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (4); (7); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
12 h 11'	(1) x,y,z [0,0,0] (4) \bar{x},\bar{y},z [0,0,0] (7) y,x,\bar{z} [0,0,0] (10) \bar{y},\bar{x},\bar{z} [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0] (5) $y,\bar{x}+y,z$ [0,0,0] (8) $x-y,\bar{y},\bar{z}$ [0,0,0] (11) $\bar{x}+y,y,\bar{z}$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0] (6) $x-y,x,z$ [0,0,0] (9) $\bar{x},\bar{x}+y,\bar{z}$ [0,0,0] (12) $x,x-y,\bar{z}$ [0,0,0]
6 g ..21'	$x,\bar{x},1/2$ [0,0,0] $\bar{x},x,1/2$ [0,0,0]	$x,2x,1/2$ [0,0,0] $\bar{x},2\bar{x},1/2$ [0,0,0]	$2\bar{x},\bar{x},1/2$ [0,0,0] $2x,x,1/2$ [0,0,0]
6 f ..21'	$x,\bar{x},0$ [0,0,0] $\bar{x},x,0$ [0,0,0]	$x,2x,0$ [0,0,0] $\bar{x},2\bar{x},0$ [0,0,0]	$2\bar{x},\bar{x},0$ [0,0,0] $2x,x,0$ [0,0,0]
6 e .2.1'	$x,0,1/2$ [0,0,0] $\bar{x},0,1/2$ [0,0,0]	$0,x,1/2$ [0,0,0] $0,\bar{x},1/2$ [0,0,0]	$\bar{x},\bar{x},1/2$ [0,0,0] $x,x,1/2$ [0,0,0]
6 d .2.1'	$x,0,0$ [0,0,0] $\bar{x},0,0$ [0,0,0]	$0,x,0$ [0,0,0] $0,\bar{x},0$ [0,0,0]	$\bar{x},\bar{x},0$ [0,0,0] $x,x,0$ [0,0,0]
2 c 6..1'	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
1 b 6221'	$0,0,1/2$ [0,0,0]		
1 a 6221'	$0,0,0$ [0,0,0]		

Continued

No. 62.2.312

$p6221'$

Symmetry of special projections

Along $[001]$ $6mm1'$

Origin at $0,0,z$

Along $[100]$ $p2mm1'$

$a^* = c$

Origin at $x,0,0$

Along $[210]$ $p2mm1'$

$a^* = c$

Origin at $x,x/2,0$

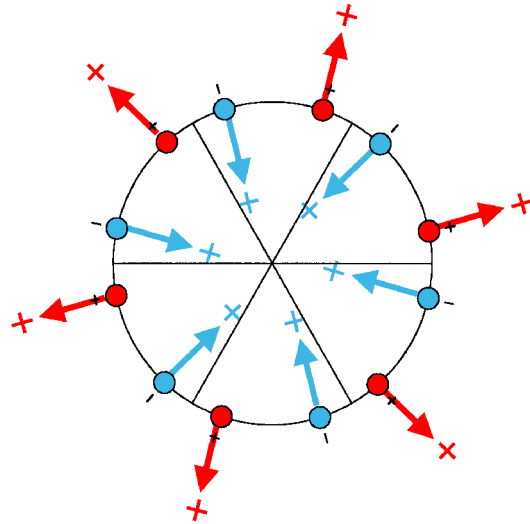
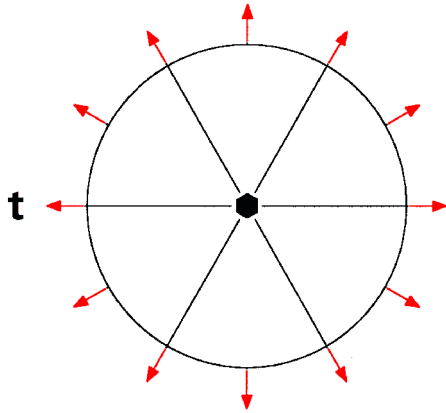
$p62'2'$

$62'2'$

Hexagonal

No. 62.3.313

$p62'2'$



Origin at $62'2'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z$ [u-v,u,w]
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [u,u-v,w]
	(10) \bar{y},\bar{x},\bar{z} [v,u,w]	(11) $\bar{x}+y,y,\bar{z}$ [u-v, \bar{v},w]	(12) $x,x-y,\bar{z}$ [$\bar{u},\bar{u}+v,w$]
6 g ..2'	$x,\bar{x},1/2$ [u,u,w]	$x,2x,1/2$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/2$ [0, \bar{u},w]
	$\bar{x},x,1/2$ [\bar{u},\bar{u},w]	$\bar{x},2\bar{x},1/2$ [u,0,w]	$2x,x,1/2$ [0,u,w]
6 f ..2'	$x,\bar{x},0$ [u,u,w]	$x,2x,0$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},0$ [0, \bar{u},w]
	$\bar{x},x,0$ [\bar{u},\bar{u},w]	$\bar{x},2\bar{x},0$ [u,0,w]	$2x,x,0$ [0,u,w]
6 e .2'	$x,0,1/2$ [u,2u,w]	$0,x,1/2$ [$2\bar{u},\bar{u},w$]	$\bar{x},\bar{x},1/2$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},1/2$ [2u,u,w]	$x,x,1/2$ [\bar{u},u,w]
6 d .2'	$x,0,0$ [u,2u,w]	$0,x,0$ [$2\bar{u},\bar{u},w$]	$\bar{x},\bar{x},0$ [u, \bar{u},w]
	$\bar{x},0,0$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},0$ [2u,u,w]	$x,x,0$ [\bar{u},u,w]
2 c 6..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	
1 b 62'2'	$0,0,1/2$ [0,0,w]		
1 a 62'2'	$0,0,0$ [0,0,w]		

Continued

No. 62.3.313

$p62'2'$

Symmetry of special projections

Along [001] 6mm

Origin at 0,0,z

Along [100] $p2'mm'$

$a^* = c$

Origin at x,0,0

Along [210] $p2'mm'$

$a^* = c$

Origin at x,x/2,0

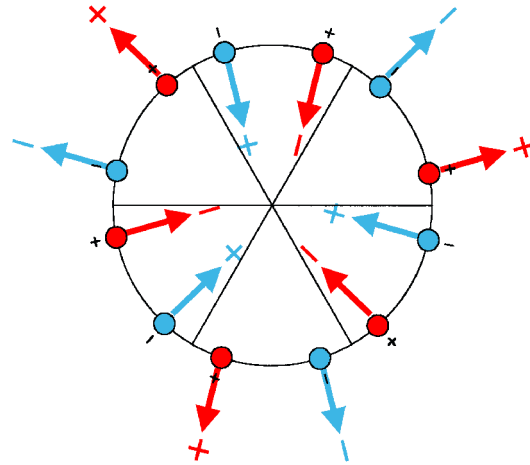
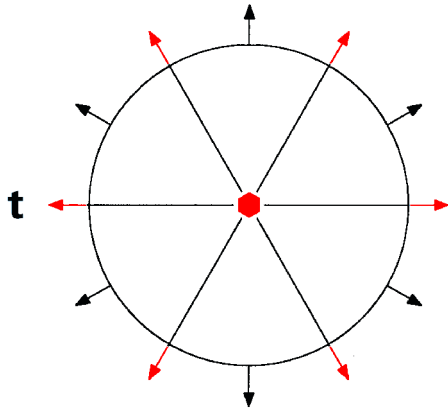
$p6'2'2$

$6'2'2$

Hexagonal

No. 62.4.314

$p6'2'2$



Origin at $6'2'2$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2^z 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) 2^x x,x,0
(2_{xy} 0,0,0)' | (8) 2^x x,0,0
(2_x 0,0,0)' | (9) 2^y 0,y,0
(2_y 0,0,0)' |
| (10) 2^x x, \bar{x} ,0
(2_3 0,0,0) | (11) 2^x x,2x,0
(2_2 0,0,0) | (12) 2^x 2x,x,0
(2_1 0,0,0) |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v, \bar{w}]	(5) $y,\bar{x}+y,z$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [u,u-v,w]
	(10) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}$ [u,u-v, \bar{w}]
6 g ..2	$x,\bar{x},1/2$ [u, \bar{u} ,0]	$x,2x,1/2$ [u,2u,0]	$2\bar{x},\bar{x},1/2$ [2 \bar{u} , \bar{u} ,0]
	$\bar{x},x,1/2$ [u, \bar{u} ,0]	$\bar{x},2\bar{x},1/2$ [u,2u,0]	$2x,x,1/2$ [2 \bar{u} , \bar{u} ,0]
6 f ..2	$x,\bar{x},0$ [u, \bar{u} ,0]	$x,2x,0$ [u,2u,0]	$2\bar{x},\bar{x},0$ [2 \bar{u} , \bar{u} ,0]
	$\bar{x},x,0$ [u, \bar{u} ,0]	$\bar{x},2\bar{x},0$ [u,2u,0]	$2x,x,0$ [2 \bar{u} , \bar{u} ,0]
6 e .2'	$x,0,1/2$ [u,2u,w]	$0,x,1/2$ [2 \bar{u} , \bar{u} ,w]	$\bar{x},\bar{x},1/2$ [u, \bar{u} ,w]
	$\bar{x},0,1/2$ [u,2u, \bar{w}]	$0,\bar{x},1/2$ [2 \bar{u} , \bar{u} , \bar{w}]	$x,x,1/2$ [u, \bar{u} , \bar{w}]
6 d .2'	$x,0,0$ [u,2u,w]	$0,x,0$ [2 \bar{u} , \bar{u} ,w]	$\bar{x},\bar{x},0$ [u, \bar{u} ,w]
	$\bar{x},0,0$ [u,2u, \bar{w}]	$0,\bar{x},0$ [2 \bar{u} , \bar{u} , \bar{w}]	$x,x,0$ [u, \bar{u} , \bar{w}]
2 c 6'..	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
1 b 6'2'2	$0,0,1/2$ [0,0,0]		
1 a 6'2'2	$0,0,0$ [0,0,0]		

Continued

No. 62.4.314

$p6'2'2$

Symmetry of special projections

Along [001] $6'm'm$

Origin at 0,0,z

Along [100] $p2'm'm$

$a^* = c$

Origin at x,0,0

Along [210] $p2mm$

$a^* = c$

Origin at x,x/2,0

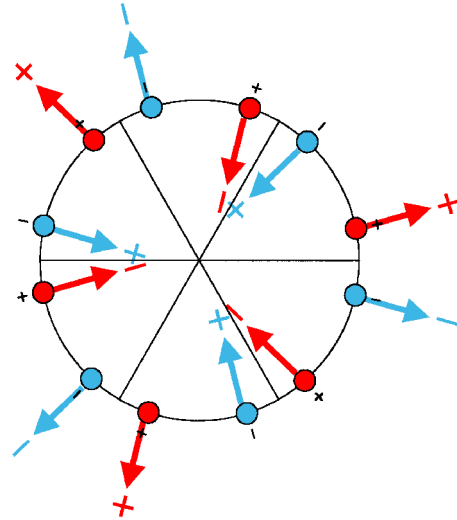
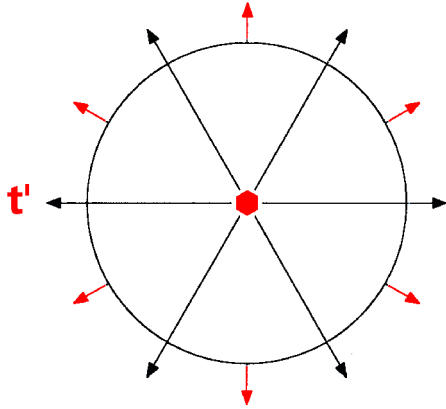
$p_{2c}6'22'$

$6221'$

Hexagonal

No. 62.5.315

$p_{2c}6'22'$



Origin at $6'22'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

For $(0,0,0) +$ set

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |

For $(0,0,1) +$ set

- | | | |
|---|--|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) 2 (0,0,1) 0,0,z
(2_z 0,0,1) | (5) $6^{-'}$ (0,0,1) 0,0,z
(6_z^{-1} 0,0,1) | (6) $6^{+'}$ (0,0,1) 0,0,z
(6_z 0,0,1) |
| (7) $2'$ x,x,1/2
(2_{xy} 0,0,1)' | (8) $2'$ x,0,1/2
(2_x 0,0,1)' | (9) $2'$ 0,y,1/2
(2_y 0,0,1)' |
| (10) 2 x, \bar{x} ,1/2
(2_3 0,0,1) | (11) 2 x,2x,1/2
(2_2 0,0,1) | (12) 2 2x,x,1/2
(2_1 0,0,1) |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(0,0,0)+	(0,0,1)' +	
12 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z [\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $y,x,\bar{z} [v,u,\bar{w}]$	(8) $x-y,\bar{y},\bar{z} [u-v,\bar{v},\bar{w}]$	(9) $\bar{x},\bar{x}+y,\bar{z} [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $\bar{y},\bar{x},\bar{z} [v,u,w]$	(11) $\bar{x}+y,y,\bar{z} [u-v,\bar{v},w]$	(12) $x,x-y,\bar{z} [\bar{u},\bar{u}+v,w]$
6 g ..2	$x,\bar{x},1/2 [u,\bar{u},0]$	$x,2x,1/2 [u,2u,0]$	$2\bar{x},\bar{x},1/2 [2\bar{u},\bar{u},0]$
	$\bar{x},x,1/2 [u,\bar{u},0]$	$\bar{x},2\bar{x},1/2 [u,2u,0]$	$2x,x,1/2 [2\bar{u},\bar{u},0]$
6 f ..2'	$x,\bar{x},0 [u,u,w]$	$x,2x,0 [\bar{u},0,w]$	$2\bar{x},\bar{x},0 [0,\bar{u},w]$
	$\bar{x},x,0 [u,u,\bar{w}]$	$\bar{x},2\bar{x},0 [\bar{u},0,\bar{w}]$	$2x,x,0 [0,\bar{u},\bar{w}]$
6 e .2'	$x,0,1/2 [u,2u,w]$	$0,x,1/2 [2\bar{u},\bar{u},w]$	$\bar{x},\bar{x},1/2 [u,\bar{u},w]$
	$\bar{x},0,1/2 [u,2u,\bar{w}]$	$0,\bar{x},1/2 [2\bar{u},\bar{u},\bar{w}]$	$x,x,1/2 [u,\bar{u},\bar{w}]$
6 d .2.	$x,0,0 [u,0,0]$	$0,x,0 [0,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$
	$\bar{x},0,0 [u,0,0]$	$0,\bar{x},0 [0,u,0]$	$x,x,0 [\bar{u},\bar{u},0]$
2 c 6'..	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 b 6'2'2	$0,0,1/2 [0,0,0]$		
1 a 6'22'	$0,0,0 [0,0,0]$		

Continued

No. 62.5.315

$\rho_{2c} 6'22'$

Symmetry of special projections

Along [001] $6mm1'$

Origin at 0,0,z

Along [100] $\rho_{2a^*} 2mm$

$a^* = c$

Origin at x,0,0

Along [210] $\rho_{2a^*} 2'm'm$

$a^* = c$

Origin at x,x/2,0

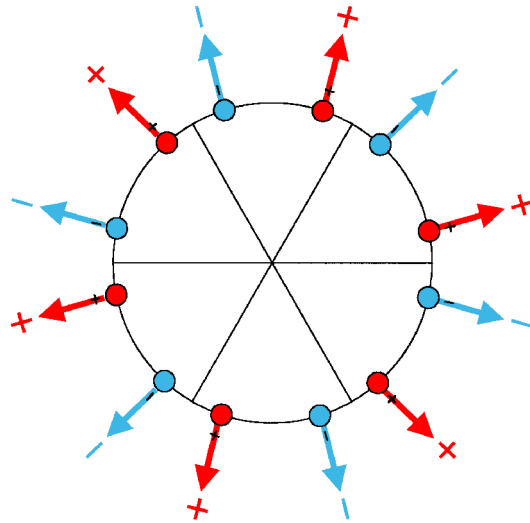
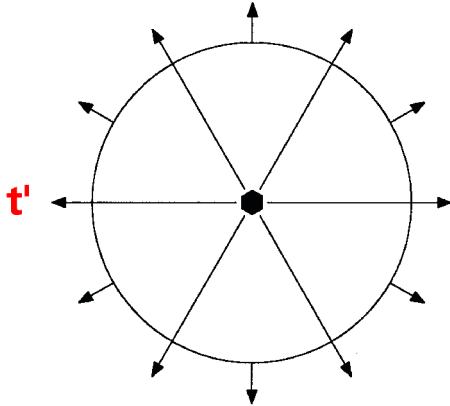
$p_{2c}622$

6221'

Hexagonal

No. 62.6.316

$p_{2c}622$



Origin at 622

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

For (0,0,0) + set

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

For (0,0,1)' + set

- | | | |
|---|---|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) $2'$ (0,0,1) 0,0,z
(2_z 0,0,1)' | (5) $6^{-'}$ (0,0,1) 0,0,z
(6_z^{-1} 0,0,1)' | (6) $6^{+'}$ (0,0,1) 0,0,z
(6_z 0,0,1)' |
| (7) $2'$ x,x,1/2
(2_{xy} 0,0,1)' | (8) $2'$ x,0,1/2
(2_x 0,0,1)' | (9) $2'$ 0,y,1/2
(2_y 0,0,1)' |
| (10) $2'$ x, \bar{x} ,1/2
(2_3 0,0,1)' | (11) $2'$ x,2x,1/2
(2_2 0,0,1)' | (12) $2'$ 2x,x,1/2
(2_1 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z$ [u-v,u,w]
	(7) y,x,\bar{z} [v,u, \bar{w}]	(8) $x-y,\bar{y},\bar{z}$ [u-v, \bar{v},\bar{w}]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}$ [u,u-v, \bar{w}]
6 g ..2'	$x,\bar{x},1/2$ [u,u,w]	$x,2x,1/2$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/2$ [0, \bar{u},w]
	$\bar{x},x,1/2$ [\bar{u},\bar{u},w]	$\bar{x},2\bar{x},1/2$ [u,0,w]	$2x,x,1/2$ [0,u,w]
6 f ..2	$x,\bar{x},0$ [u, $\bar{u},0$]	$x,2x,0$ [u,2u,0]	$2\bar{x},\bar{x},0$ [2 $\bar{u},\bar{u},0$]
	$\bar{x},x,0$ [$\bar{u},u,0$]	$\bar{x},2\bar{x},0$ [$\bar{u},2\bar{u},0$]	$2x,x,0$ [2u,u,0]
6 e .2'	$x,0,1/2$ [u,2u,w]	$0,x,1/2$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},1/2$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},1/2$ [2u,u,w]	$x,x,1/2$ [\bar{u},u,w]
6 d .2.	$x,0,0$ [u,0,0]	$0,x,0$ [0,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]
	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,\bar{x},0$ [0, $\bar{u},0$]	$x,x,0$ [u,u,0]
2 c 6..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]	
1 b 6'2'2'	$0,0,1/2$ [0,0,w]		
1 a 622	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $p_{2a^*}2m'm'$ $a^* = c$	Along [210] $p_{2a^*}2m'm'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

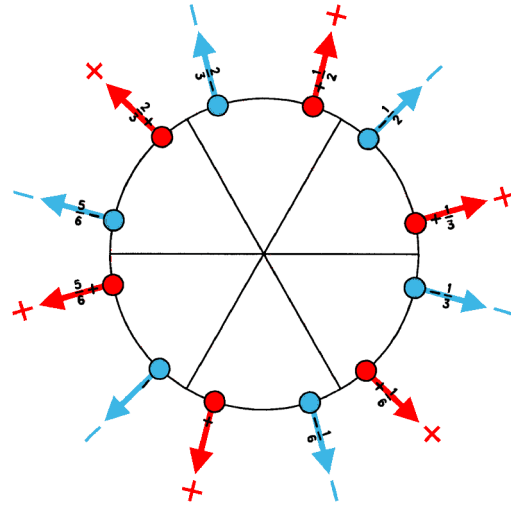
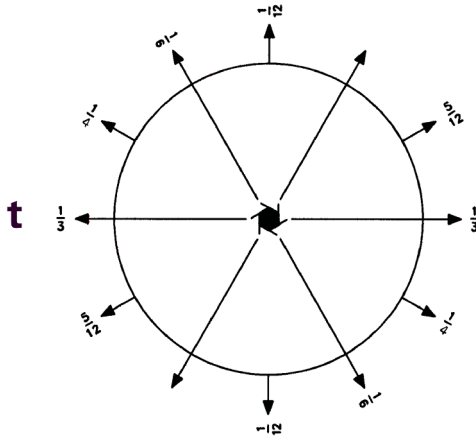
$p6_122$

622

Hexagonal

No. 63.1.317

$p6_122$



Origin on $2[100]$ at $6_1(2,1,1)1$

Asymmetric unit $0 \leq z \leq 1/12$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,1/3) 0,0,z
(3_z 0,0,1/3) | (3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} 0,0,2/3) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,5/6) 0,0,z
(6_z^{-1} 0,0,5/6) | (6) 6^+ (0,0,1/6) 0,0,z
(6_z 0,0,1/6) |
| (7) 2 x,x,1/6
(2_{xy} 0,0,1/3) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,1/3
(2_y 0,0,2/3) |
| (10) 2 x, \bar{x} ,5/12
(2_3 0,0,5/6) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/12
(2_1 0,0,1/6) |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 c 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+5/6$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/6$ [$u-v,u,w$]
	(7) $y,x,\bar{z}+1/3$ [v,u,\bar{w}]	(8) $x-y,\bar{y},\bar{z}$ [$u-v,\bar{v},\bar{w}$]	(9) $\bar{x},\bar{x}+y,\bar{z}+2/3$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $\bar{y},\bar{x},\bar{z}+5/6$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/6$ [$u,u-v,\bar{w}$]
6 b ..2	$x,2x,1/4$ [u,2u,0]	$2\bar{x},\bar{x},7/12$ [$2\bar{u},\bar{u},0$]	$x,\bar{x},11/12$ [u, \bar{u} ,0]
	$\bar{x},2\bar{x},3/4$ [$\bar{u},2\bar{u},0$]	$2x,x,1/12$ [2u,u,0]	$\bar{x},x,5/12$ [$\bar{u},u,0$]
6 a .2.	$x,0,0$ [u,0,0]	$0,x,1/3$ [0,u,0]	$\bar{x},\bar{x},2/3$ [$\bar{u},\bar{u},0$]
	$\bar{x},0,1/2$ [$\bar{u},0,0$]	$0,\bar{x},5/6$ [0, \bar{u} ,0]	$x,x,1/6$ [u,u,0]

Symmetry of special projections

Along [001] 6m'm'	Along [100] p2m'g' a* = c	Along [210] p2m'g' a* = c
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,1/12

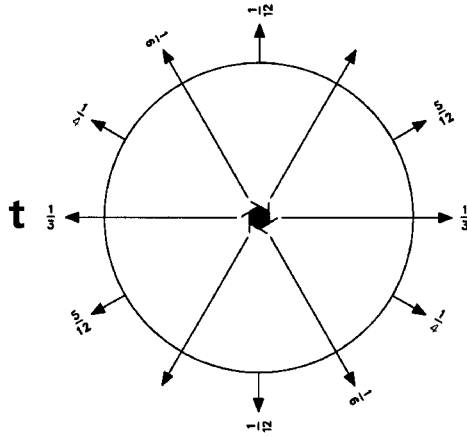
$p6_1221'$

$6221'$

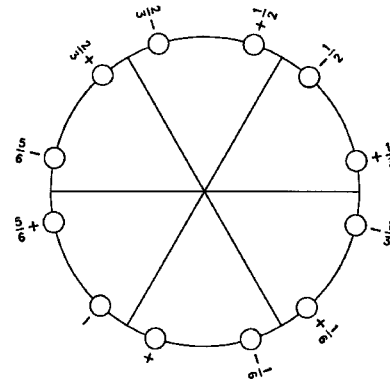
Hexagonal

No. 63.2.318

$p6_1221'$



1'



Origin on $2[100]1'$ at $6_1(2,1,1)11'$

Asymmetric unit $0 \leq z \leq 1/12$

Symmetry operations

For $1 +$ set

- | | | |
|--|---|---|
| (1) 1
$(1 0,0,0)$ | (2) $3^+ (0,0,1/3) \ 0,0,z$
$(3_z 0,0,1/3)$ | (3) $3^- (0,0,2/3) \ 0,0,z$
$(3_z^{-1} 0,0,2/3)$ |
| (4) $2 (0,0,1/2) \ 0,0,z$
$(2_z 0,0,1/2)$ | (5) $6^- (0,0,5/6) \ 0,0,z$
$(6_z^{-1} 0,0,5/6)$ | (6) $6^+ (0,0,1/6) \ 0,0,z$
$(6_z 0,0,1/6)$ |
| (7) $2 \ x,x,1/6$
$(2_{xy} 0,0,1/3)$ | (8) $2 \ x,0,0$
$(2_x 0,0,0)$ | (9) $2 \ 0,y,1/3$
$(2_y 0,0,2/3)$ |
| (10) $2 \ x,\bar{x},5/12$
$(2_3 0,0,5/6)$ | (11) $2 \ x,2x,1/4$
$(2_2 0,0,1/2)$ | (12) $2 \ 2x,x,1/12$
$(2_1 0,0,1/6)$ |

For $1' +$ set

- | | | |
|--|---|---|
| (1) $1'$
$(1 0,0,0)'$ | (2) $3^{+'} (0,0,1/3) \ 0,0,z$
$(3_z 0,0,1/3)'$ | (3) $3^{-'} (0,0,2/3) \ 0,0,z$
$(3_z^{-1} 0,0,2/3)'$ |
| (4) $2' (0,0,1/2) \ 0,0,z$
$(2_z 0,0,1/2)'$ | (5) $6^{-'} (0,0,5/6) \ 0,0,z$
$(6_z^{-1} 0,0,5/6)'$ | (6) $6^{+'} (0,0,1/6) \ 0,0,z$
$(6_z 0,0,1/6)'$ |
| (7) $2' \ x,x,1/6$
$(2_{xy} 0,0,1/3)'$ | (8) $2' \ x,0,0$
$(2_x 0,0,0)'$ | (9) $2' \ 0,y,1/3$
$(2_y 0,0,2/3)'$ |
| (10) $2' \ x,\bar{x},5/12$
$(2_3 0,0,5/6)'$ | (11) $2' \ x,2x,1/4$
$(2_2 0,0,1/2)'$ | (12) $2' \ 2x,x,1/12$
$(2_1 0,0,1/6)'$ |

Generators selected (1); t(0,0,1); (2); (4); (7); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
12 c 11'	(1) x,y,z [0,0,0] (4) $\bar{x},\bar{y},z+1/2$ [0,0,0] (7) $y,x,\bar{z}+1/3$ [0,0,0] (10) $\bar{y},\bar{x},\bar{z}+5/6$ [0,0,0]	(2) $\bar{y},x-y,z+1/3$ [0,0,0] (5) $y,\bar{x}+y,z+5/6$ [0,0,0] (8) $x-y,\bar{y},\bar{z}$ [0,0,0] (11) $\bar{x}+y,y,\bar{z}+1/2$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+2/3$ [0,0,0] (6) $x-y,x,z+1/6$ [0,0,0] (9) $\bar{x},\bar{x}+y,\bar{z}+2/3$ [0,0,0] (12) $x,x-y,\bar{z}+1/6$ [0,0,0]
6 b ..21'	$x,2x,1/4$ [0,0,0] $\bar{x},2\bar{x},3/4$ [0,0,0]	$2\bar{x},\bar{x},7/12$ [0,0,0] $2x,x,1/12$ [0,0,0]	$x,\bar{x},11/12$ [0,0,0] $\bar{x},x,5/12$ [0,0,0]
6 a .2.1'	$x,0,0$ [0,0,0] $\bar{x},0,1/2$ [0,0,0]	$0,x,1/3$ [0,0,0] $0,\bar{x},5/6$ [0,0,0]	$\bar{x},\bar{x},2/3$ [0,0,0] $x,x,1/6$ [0,0,0]

Symmetry of special projections

Along [001] 6mm1'	Along [100] p2mg1'	Along [210] p2mg1'
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,1/12

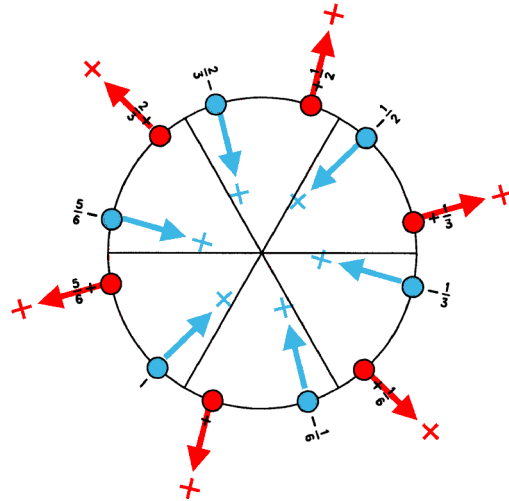
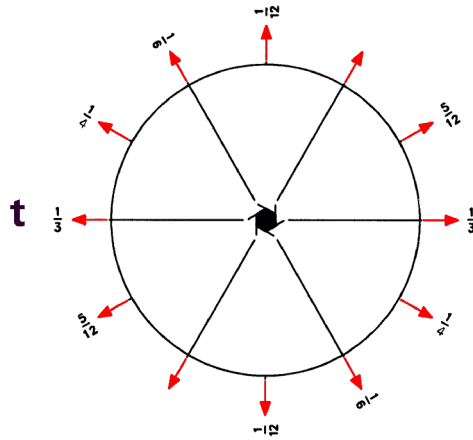
$p6_12'2'$

$62'2'$

Hexagonal

No. 63.3.319

$p6_12'2'$



Origin on $2'[100]$ at $6_1(2',1,1)1$

Asymmetric unit $0 \leq z \leq 1/12$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,1/3) 0,0,z
(3_z 0,0,1/3) | (3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} 0,0,2/3) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,5/6) 0,0,z
(6_z^{-1} 0,0,5/6) | (6) 6^+ (0,0,1/6) 0,0,z
(6_z 0,0,1/6) |
| (7) $2'$ $x,x,1/6$
(2_{xy} 0,0,1/3)' | (8) $2'$ $x,0,0$
(2_x 0,0,0)' | (9) $2'$ $0,y,1/3$
(2_y 0,0,2/3)' |
| (10) $2'$ $x,\bar{x},5/12$
(2_3 0,0,5/6)' | (11) $2'$ $x,2x,1/4$
(2_2 0,0,1/2)' | (12) $2'$ $2x,x,1/12$
(2_1 0,0,1/6)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 c 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+5/6$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/6$ [$u-v,u,w$]
	(7) $y,x,\bar{z}+1/3$ [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+2/3$ [$u,u-v,w$]
	(10) $\bar{y},\bar{x},\bar{z}+5/6$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$u-v,\bar{v},w$]	(12) $x,x-y,\bar{z}+1/6$ [$\bar{u},\bar{u}+v,w$]
6 b ..2'	$x,2x,1/4$ [u,0,w]	$2\bar{x},\bar{x},7/12$ [0,u,w]	$x,\bar{x},11/12$ [\bar{u},\bar{u},w]
	$\bar{x},2\bar{x},3/4$ [$\bar{u},0,w$]	$2x,x,1/12$ [0, \bar{u},w]	$\bar{x},x,5/12$ [u,u,w]
6 a .2'	$x,0,0$ [u,2u,w]	$0,x,1/3$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},2/3$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},5/6$ [2u,u,w]	$x,x,1/6$ [\bar{u},u,w]

Symmetry of special projections

Along [001] 6mm	Along [100] $p2'mg'$ $a^* = c$	Along [210] $p2'mg'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,1/12

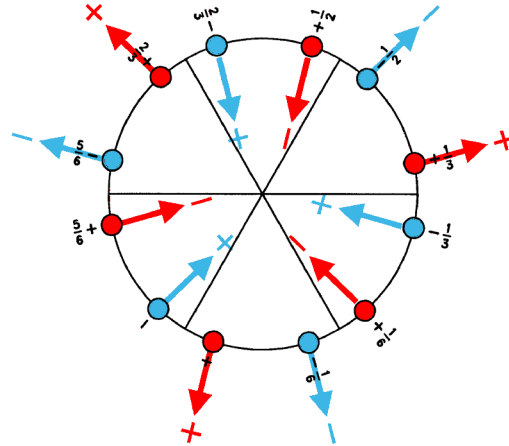
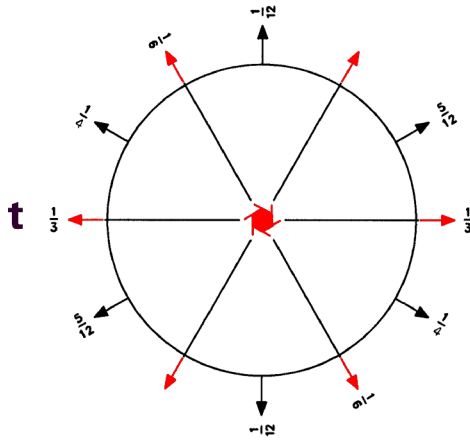
$p6_1'2'2'$

$6'2'2'$

Hexagonal

No. 63.4.320

$p6_1'2'2'$



Origin on $2'[100]$ at $6_1'(2',1,1)1$

Asymmetric unit $0 \leq z \leq 1/12$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) $3^+ (0,0,1/3) \ 0,0,z$
(3_z 0,0,1/3) | (3) $3^- (0,0,2/3) \ 0,0,z$
(3_z^{-1} 0,0,2/3) |
| (4) $2' (0,0,1/2) \ 0,0,z$
(2_z 0,0,1/2)' | (5) $6^- (0,0,5/6) \ 0,0,z$
(6_z^{-1} 0,0,5/6)' | (6) $6^+ (0,0,1/6) \ 0,0,z$
(6_z 0,0,1/6)' |
| (7) $2' \ x,x,1/6$
(2_{xy} 0,0,1/3)' | (8) $2' \ x,0,0$
(2_x 0,0,0)' | (9) $2' \ 0,y,1/3$
(2_y 0,0,2/3)' |
| (10) $2 \ x,\bar{x},5/12$
(2_3 0,0,5/6) | (11) $2 \ x,2x,1/4$
(2_2 0,0,1/2) | (12) $2 \ 2x,x,1/12$
(2_1 0,0,1/6) |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 c 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	(5) $y,\bar{x}+y,z+5/6$ [$\bar{v},u-v,\bar{w}$]	(6) x-y,x,z+1/6 [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) y,x, $\bar{z}+1/3$ [\bar{v},\bar{u},w]	(8) x-y, \bar{y},\bar{z} [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+2/3$ [u,u-v,w]
	(10) $\bar{y},\bar{x},\bar{z}+5/6$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) x,x-y, $\bar{z}+1/6$ [u,u-v, \bar{w}]
6 b ..2	x,2x,1/4 [u,2u,0]	2 $\bar{x},\bar{x},7/12$ [2 $\bar{u},\bar{u},0$]	x, $\bar{x},11/12$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},3/4$ [u,2u,0]	2x,x,1/12 [2 $\bar{u},\bar{u},0$]	$\bar{x},x,5/12$ [u, $\bar{u},0$]
6 a .2'	x,0,0 [u,2u,w]	0,x,1/3 [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},2/3$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [u,2u, \bar{w}]	0, $\bar{x},5/6$ [2 \bar{u},\bar{u},\bar{w}]	x,x,1/6 [u, \bar{u},\bar{w}]

Symmetry of special projections

Along [001] 6'mm'	Along [100] p2'm'g a* = c	Along [210] p2'm'g a* = c
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,1/12

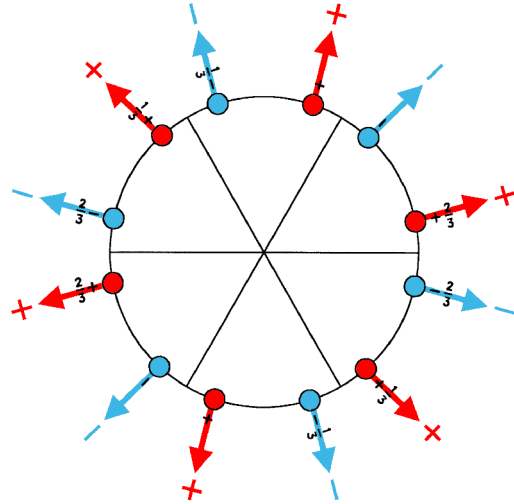
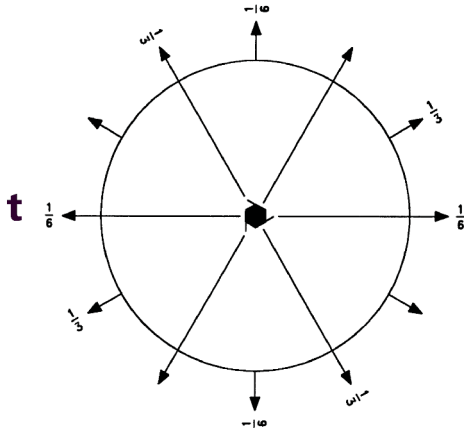
$p6_222$

622

Hexagonal

No. 64.1.321

$p6_222$



Origin on 222 at $6_2(2,1,1)(1,2,1)$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,2/3) 0,0,z
(3_z 0,0,2/3) | (3) 3^- (0,0,1/3) 0,0,z
(3_z^{-1} 0,0,1/3) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- (0,0,2/3) 0,0,z
(6_z^{-1} 0,0,2/3) | (6) 6^+ (0,0,1/3) 0,0,z
(6_z 0,0,1/3) |
| (7) 2 x,x,1/3
(2_{xy} 0,0,2/3) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,1/6
(2_y 0,0,1/3) |
| (10) 2 x, \bar{x} ,1/3
(2_3 0,0,2/3) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,1/6
(2_1 0,0,1/3) |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+2/3$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/3$ [$u-v,u,w$]
	(7) $y,x,\bar{z}+2/3$ [v,u,\bar{w}]	(8) $x-y,\bar{y},\bar{z}$ [$u-v,\bar{v},\bar{w}$]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/3$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $\bar{y},\bar{x},\bar{z}+2/3$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/3$ [$u,u-v,\bar{w}$]
6 g ..2	x,2x,1/2 [u,2u,0]	2 $\bar{x},\bar{x},1/6$ [2 $\bar{u},\bar{u},0$]	x, $\bar{x},5/6$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},1/2$ [$\bar{u},2\bar{u},0$]	2x,x,1/6 [2u,u,0]	$\bar{x},x,5/6$ [$\bar{u},u,0$]
6 f ..2	x,2x,0 [u,2u,0]	2 $\bar{x},\bar{x},2/3$ [2 $\bar{u},\bar{u},0$]	x, $\bar{x},1/3$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},0$ [$\bar{u},2\bar{u},0$]	2x,x,2/3 [2u,u,0]	$\bar{x},x,1/3$ [$\bar{u},u,0$]
6 e .2.	x,0,1/2 [u,0,0]	0,x,1/6 [0,u,0]	$\bar{x},\bar{x},5/6$ [$\bar{u},\bar{u},0$]
	$\bar{x},0,1/2$ [$\bar{u},0,0$]	0, $\bar{x},1/6$ [0, $\bar{u},0$]	x,x,5/6 [u,u,0]
6 d .2.	x,0,0 [u,0,0]	0,x,2/3 [0,u,0]	$\bar{x},\bar{x},1/3$ [$\bar{u},\bar{u},0$]
	$\bar{x},0,0$ [$\bar{u},0,0$]	0, $\bar{x},2/3$ [0, $\bar{u},0$]	x,x,1/3 [u,u,0]
6 c 2..	0,0,z [0,0,w]	0,0,z+2/3 [0,0,w]	0,0,z+1/3 [0,0,w]
	0,0, $\bar{z}+2/3$ [0,0, \bar{w}]	0,0, \bar{z} [0,0, \bar{w}]	0,0, $\bar{z}+1/3$ [0,0, \bar{w}]
3 b 222	0,0,1/2 [0,0,0]	0,0,1/6 [0,0,0]	0,0,5/6 [0,0,0]
3 a 222	0,0,0 [0,0,0]	0,0,2/3 [0,0,0]	0,0,1/3 [0,0,0]

Symmetry of special projectionsAlong [001] $6m'm'$

Origin at 0,0,z

Along [100] $p2m'm'$ $a^* = c$

Origin at x,0,0

Along [210] $p2m'm'$ $a^* = c$

Origin at x,x/2,1/6

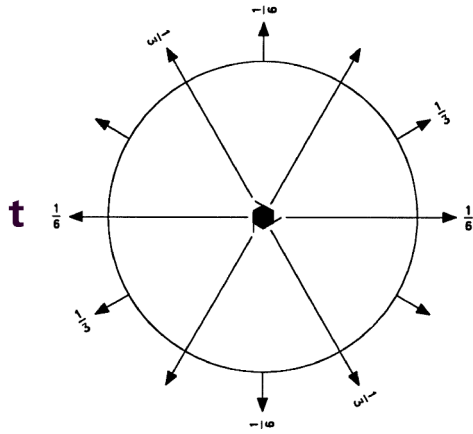
$p6_2221'$

$6221'$

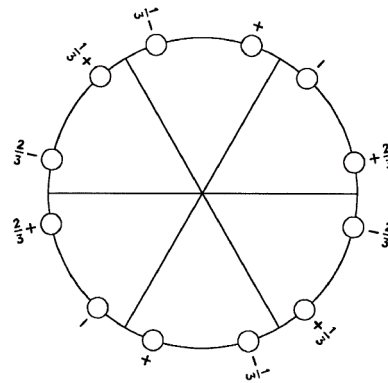
Hexagonal

No. 64.2.322

$p6_2221'$



1'



Origin on $2221'$ at $6_2(2,1,1)(1,2,1)1'$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

For 1 + set

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,2/3) 0,0,z
(3_z 0,0,2/3) | (3) 3^- (0,0,1/3) 0,0,z
(3_z^{-1} 0,0,1/3) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- (0,0,2/3) 0,0,z
(6_z^{-1} 0,0,2/3) | (6) 6^+ (0,0,1/3) 0,0,z
(6_z 0,0,1/3) |
| (7) 2 x,x,1/3
(2_{xy} 0,0,2/3) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,1/6
(2_y 0,0,1/3) |
| (10) 2 x, \bar{x} ,1/3
(2_3 0,0,2/3) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,1/6
(2_1 0,0,1/3) |

For 1' + set

- | | | |
|---|---|---|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ (0,0,2/3) 0,0,z
(3_z 0,0,2/3)' | (3) $3^{-'}$ (0,0,1/3) 0,0,z
(3_z^{-1} 0,0,1/3)' |
| (4) 2' 0,0,z
(2_z 0,0,0)' | (5) $6^{-'}$ (0,0,2/3) 0,0,z
(6_z^{-1} 0,0,2/3)' | (6) $6^{+'}$ (0,0,1/3) 0,0,z
(6_z 0,0,1/3)' |
| (7) 2' x,x,1/3
(2_{xy} 0,0,2/3)' | (8) 2' x,0,0
(2_x 0,0,0)' | (9) 2' 0,y,1/6
(2_y 0,0,1/3)' |
| (10) 2' x, \bar{x} ,1/3
(2_3 0,0,2/3)' | (11) 2' x,2x,0
(2_2 0,0,0)' | (12) 2' 2x,x,1/6
(2_1 0,0,1/3)' |

Generators selected (1); t(0,0,1); (2); (4); (7); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1'+	
12 h 11'	(1) x,y,z [0,0,0] (4) \bar{x},\bar{y},z [0,0,0] (7) y,x, $\bar{z}+2/3$ [0,0,0] (10) $\bar{y},\bar{x},\bar{z}+2/3$ [0,0,0]	(2) $\bar{y},x-y,z+2/3$ [0,0,0] (5) y, $\bar{x}+y,z+2/3$ [0,0,0] (8) x-y, \bar{y},\bar{z} [0,0,0] (11) $\bar{x}+y,y,\bar{z}$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+1/3$ [0,0,0] (6) x-y,x,z+1/3 [0,0,0] (9) $\bar{x},\bar{x}+y,\bar{z}+1/3$ [0,0,0] (12) x,x-y, $\bar{z}+1/3$ [0,0,0]
6 g ..21'	x,2x,1/2 [0,0,0] $\bar{x},2\bar{x},1/2$ [0,0,0]	2 $\bar{x},\bar{x},1/6$ [0,0,0] 2x,x,1/6 [0,0,0]	x, $\bar{x},5/6$ [0,0,0] $\bar{x},x,5/6$ [0,0,0]
6 f ..21'	x,2x,0 [0,0,0] $\bar{x},2\bar{x},0$ [0,0,0]	2 $\bar{x},\bar{x},2/3$ [0,0,0] 2x,x,2/3 [0,0,0]	x, $\bar{x},1/3$ [0,0,0] $\bar{x},x,1/3$ [0,0,0]
6 e .2.1'	x,0,1/2 [0,0,0] $\bar{x},0,1/2$ [0,0,0]	0,x,1/6 [0,0,0] 0, $\bar{x},1/6$ [0,0,0]	$\bar{x},\bar{x},5/6$ [0,0,0] x,x,5/6 [0,0,0]
6 d .2.1'	x,0,0 [0,0,0] $\bar{x},0,0$ [0,0,0]	0,x,2/3 [0,0,0] 0, $\bar{x},2/3$ [0,0,0]	$\bar{x},\bar{x},1/3$ [0,0,0] x,x,1/3 [0,0,0]
6 c 2..1'	0,0,z [0,0,0] 0,0, $\bar{z}+2/3$ [0,0,0]	0,0,z+2/3 [0,0,0] 0,0, \bar{z} [0,0,0]	0,0,z+1/3 [0,0,0] 0,0, $\bar{z}+1/3$ [0,0,0]
3 b 2221'	0,0,1/2 [0,0,0]	0,0,1/6 [0,0,0]	0,0,5/6 [0,0,0]
3 a 2221'	0,0,0 [0,0,0]	0,0,2/3 [0,0,0]	0,0,1/3 [0,0,0]

Symmetry of special projectionsAlong [001] $6mm1'$

Origin at 0,0,z

Along [100] $p2mm1'$ $a^* = c$

Origin at x,0,0

Along [210] $p2mm1'$ $a^* = c$

Origin at x,x/2,1/6

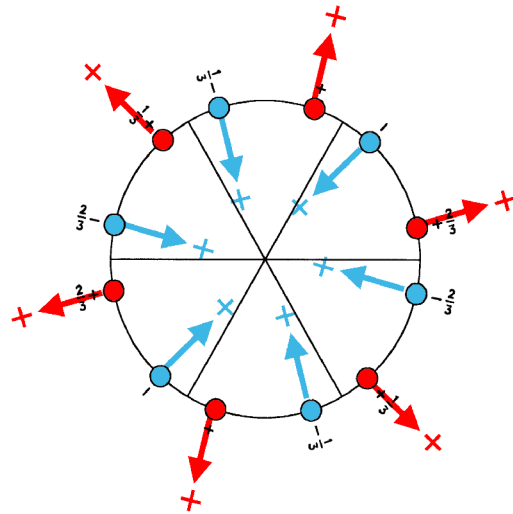
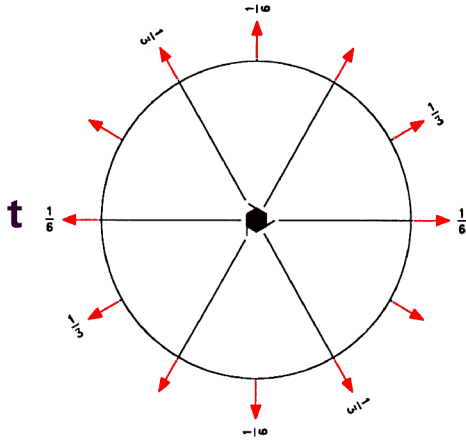
$p6_22'2'$

$62'2'$

Hexagonal

No. 64.3.323

$p6_22'2'$



Origin on $2'2'2'$ at $6_2(2',1,1)(1,2',1)$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,2/3) 0,0,z
(3_z 0,0,2/3) | (3) 3^- (0,0,1/3) 0,0,z
(3_z^{-1} 0,0,1/3) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- (0,0,2/3) 0,0,z
(6_z^{-1} 0,0,2/3) | (6) 6^+ (0,0,1/3) 0,0,z
(6_z 0,0,1/3) |
| (7) $2'$ x,x,1/3
(2_{xy} 0,0,2/3)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,1/6
(2_y 0,0,1/3)' |
| (10) $2'$ x, \bar{x} ,1/3
(2_3 0,0,2/3)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,1/6
(2_1 0,0,1/3)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+2/3$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/3$ [u-v,u,w]
	(7) $y,x,\bar{z}+2/3$ [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/3$ [u,u-v,w]
	(10) $\bar{y},\bar{x},\bar{z}+2/3$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}$ [u-v, \bar{v},w]	(12) $x,x-y,\bar{z}+1/3$ [$\bar{u},\bar{u}+v,w$]
6 g ..2'	$x,2x,1/2$ [u,0,w]	$2\bar{x},\bar{x},1/6$ [0,u,w]	$x,\bar{x},5/6$ [\bar{u},\bar{u},w]
	$\bar{x},2\bar{x},1/2$ [$\bar{u},0,w$]	$2x,x,1/6$ [0, \bar{u},w]	$\bar{x},x,5/6$ [u,u,w]
6 f ..2'	$x,2x,0$ [u,0,w]	$2\bar{x},\bar{x},2/3$ [0,u,w]	$x,\bar{x},1/3$ [\bar{u},\bar{u},w]
	$\bar{x},2\bar{x},0$ [$\bar{u},0,w$]	$2x,x,2/3$ [0, \bar{u},w]	$\bar{x},x,1/3$ [u,u,w]
6 e .2'	$x,0,1/2$ [u,2u,w]	$0,x,1/6$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},5/6$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},1/6$ [2u,u,w]	$x,x,5/6$ [\bar{u},u,w]
6 d .2'	$x,0,0$ [u,2u,w]	$0,x,2/3$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},1/3$ [u, \bar{u},w]
	$\bar{x},0,0$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},2/3$ [2u,u,w]	$x,x,1/3$ [\bar{u},u,w]
6 c 2..	$0,0,z$ [0,0,w]	$0,0,z+2/3$ [0,0,w]	$0,0,z+1/3$ [0,0,w]
	$0,0,\bar{z}+2/3$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	$0,0,\bar{z}+1/3$ [0,0,w]
3 b 22'2'	$0,0,1/2$ [0,0,w]	$0,0,1/6$ [0,0,w]	$0,0,5/6$ [0,0,w]
3 a 22'2'	$0,0,0$ [0,0,w]	$0,0,2/3$ [0,0,w]	$0,0,1/3$ [0,0,w]

Continued

No. 64.3.323

$p6_2 2'2'$

Symmetry of special projections

Along [001] $6mm$

Origin at $0,0,z$

Along [100] $p2'mm'$

$a^* = c$

Origin at $x,0,0$

Along [210] $p2'mm'$

$a^* = c$

Origin at $x,x/2,1/6$

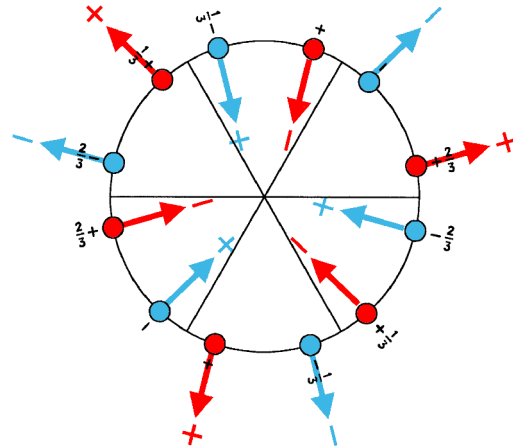
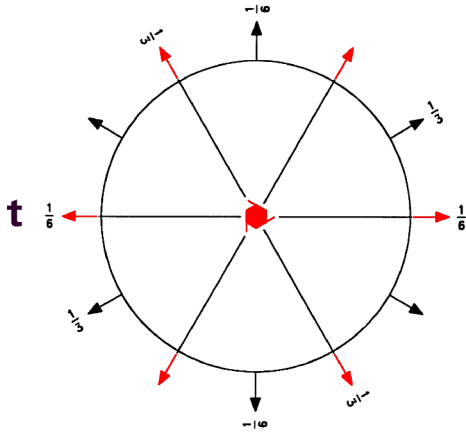
$p6_2'2'2'$

$6'2'2'$

Hexagonal

No. 64.4.324

$p6_2'2'2'$



Origin on $2'2'2'$ at $6_2'(2',1,1)(1,2,1)$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,2/3) 0,0,z
(3_z 0,0,2/3) | (3) 3^- (0,0,1/3) 0,0,z
(3_z^{-1} 0,0,1/3) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- (0,0,2/3) 0,0,z
(6_z^{-1} 0,0,2/3)' | (6) 6^+ (0,0,1/3) 0,0,z
(6_z 0,0,1/3)' |
| (7) $2'$ x,x,1/3
(2_{xy} 0,0,2/3)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,1/6
(2_y 0,0,1/3)' |
| (10) 2 x, \bar{x} ,1/3
(2_3 0,0,2/3) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,1/6
(2_1 0,0,1/3) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v, \bar{w}]	(5) $y,\bar{x}+y,z+2/3$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+1/3$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) $y,x,\bar{z}+2/3$ [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/3$ [u,u-v,w]
	(10) $\bar{y},\bar{x},\bar{z}+2/3$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/3$ [u,u-v, \bar{w}]
6 g ..2	$x,2x,1/2$ [u,2u,0]	$2\bar{x},\bar{x},1/6$ [2 $\bar{u},\bar{u},0$]	$x,\bar{x},5/6$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},1/2$ [u,2u,0]	$2x,x,1/6$ [2 $\bar{u},\bar{u},0$]	$\bar{x},x,5/6$ [u, $\bar{u},0$]
6 f ..2	$x,2x,0$ [u,2u,0]	$2\bar{x},\bar{x},2/3$ [2 $\bar{u},\bar{u},0$]	$x,\bar{x},1/3$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},0$ [u,2u,0]	$2x,x,2/3$ [2 $\bar{u},\bar{u},0$]	$\bar{x},x,1/3$ [u, $\bar{u},0$]
6 e .2'	$x,0,1/2$ [u,2u,w]	$0,x,1/6$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},5/6$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [u,2u, \bar{w}]	$0,\bar{x},1/6$ [2 \bar{u},\bar{u},\bar{w}]	$x,x,5/6$ [u, \bar{u},w]
6 d .2'	$x,0,0$ [u,2u,w]	$0,x,2/3$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},1/3$ [u, \bar{u},w]
	$\bar{x},0,0$ [u,2u, \bar{w}]	$0,\bar{x},2/3$ [2 \bar{u},\bar{u},\bar{w}]	$x,x,1/3$ [u, \bar{u},w]
6 c 2'..	$0,0,z$ [u,v,0]	$0,0,z+2/3$ [$\bar{v},u-v,0$]	$0,0,z+1/3$ [$\bar{u}+v,\bar{u},0$]
	$0,0,\bar{z}+2/3$ [$\bar{v},\bar{u},0$]	$0,0,\bar{z}$ [$\bar{u}+v,v,0$]	$0,0,\bar{z}+1/3$ [u,u-v,0]
3 b 2'2'2	$0,0,1/2$ [u,2u,0]	$0,0,1/6$ [2 $\bar{u},\bar{u},0$]	$0,0,5/6$ [u, $\bar{u},0$]
3 a 2'2'2	$0,0,0$ [u,2u,0]	$0,0,2/3$ [2 $\bar{u},\bar{u},0$]	$0,0,1/3$ [u, $\bar{u},0$]

Continued

No. 64.4.324

$p6_2'2'$

Symmetry of special projections

Along [001] $6'm'm'$

Origin at 0,0,z

Along [100] $p2m'm'$

$a^* = c$

Origin at x,0,0

Along [210] $p2mm$

$a^* = c$

Origin at x,x/2,1/6

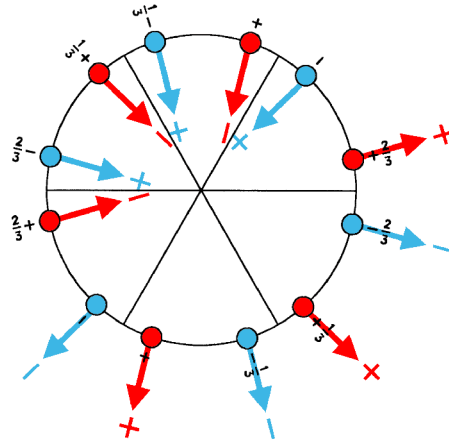
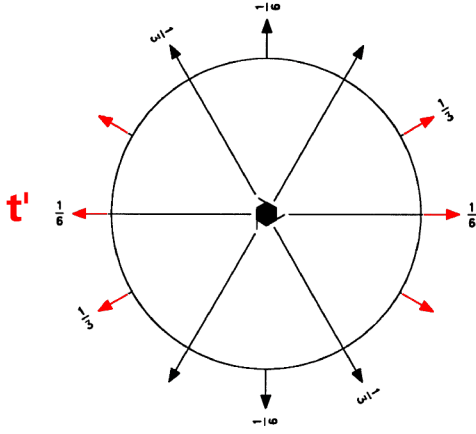
$p_{2c}6_222$

$6221'$

Hexagonal

No. 64.5.325

$p_{2c}6_222$



Origin on $22'2'$ at $6_2(2,1,1)(1,2',1)$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

For $(0,0,0)$ + set

- | | | |
|---|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ $(0,0,2/3)$ $0,0,z$
(3_z 0,0,2/3) | (3) 3^- $(0,0,1/3)$ $0,0,z$
(3_z^{-1} 0,0,1/3)' |
| (4) $2'$ $0,0,z$
(2_z 0,0,0)' | (5) 6^- $(0,0,2/3)$ $0,0,z$
(6_z^{-1} 0,0,2/3)' | (6) 6^+ $(0,0,1/3)$ $0,0,z$
(6_z 0,0,1/3) |
| (7) 2 $x,x,1/3$
(2_{xy} 0,0,2/3) | (8) 2 $x,0,0$
(2_x 0,0,0) | (9) $2'$ $0,y,1/6$
(2_y 0,0,1/3)' |
| (10) $2'$ $x,\bar{x},1/3$
(2_3 0,0,2/3)' | (11) $2'$ $x,2x,0$
(2_2 0,0,0)' | (12) 2 $2x,x,1/6$
(2_1 0,0,1/3) |

For $(0,0,1)'$ + set

- | | | |
|---|---|---|
| (1) t' $(0,0,1)$
(1 0,0,1)' | (2) $3^{+'}$ $(0,0,5/3)$ $0,0,z$
(3_z 0,0,5/3)' | (3) 3^- $(0,0,4/3)$ $0,0,z$
(3_z^{-1} 0,0,4/3) |
| (4) 2 $(0,0,1)$ $0,0,z$
(2_z 0,0,1) | (5) 6^- $(0,0,5/3)$ $0,0,z$
(6_z^{-1} 0,0,5/3) | (6) $6^{+'}$ $(0,0,4/3)$ $0,0,z$
(6_z 0,0,4/3)' |
| (7) $2'$ $x,x,5/6$
(2_{xy} 0,0,5/3)' | (8) $2'$ $x,0,1/2$
(2_x 0,0,1)' | (9) 2 $0,y,2/3$
(2_y 0,0,4/3) |
| (10) 2 $x,\bar{x},5/6$
(2_3 0,0,5/3) | (11) 2 $x,2x,1/2$
(2_2 0,0,1) | (12) $2'$ $2x,x,2/3$
(2_1 0,0,4/3)' |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
12 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z+2/3 [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z+1/3 [u-v,u,\bar{w}]$
	(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z+2/3 [\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z+1/3 [u-v,u,w]$
	(7) $y,x,\bar{z}+2/3 [v,u,\bar{w}]$	(8) $x-y,\bar{y},\bar{z} [u-v,\bar{v},\bar{w}]$	(9) $\bar{x},\bar{x}+y,\bar{z}+1/3 [u,u-v,w]$
	(10) $\bar{y},\bar{x},\bar{z}+2/3 [v,u,w]$	(11) $\bar{x}+y,y,\bar{z} [u-v,\bar{v},w]$	(12) $x,x-y,\bar{z}+1/3 [u,u-v,\bar{w}]$
6 g ..2	$x,2x,1/2 [u,2u,0]$	$2\bar{x},\bar{x},1/6 [2u,u,0]$	$x,\bar{x},5/6 [\bar{u},u,0]$
	$\bar{x},2\bar{x},1/2 [u,2u,0]$	$2x,x,1/6 [2u,u,0]$	$\bar{x},x,5/6 [\bar{u},u,0]$
6 f ..2'	$x,2x,0 [u,0,w]$	$2\bar{x},\bar{x},2/3 [0,u,w]$	$x,\bar{x},1/3 [u,u,\bar{w}]$
	$\bar{x},2\bar{x},0 [u,0,\bar{w}]$	$2x,x,2/3 [0,u,\bar{w}]$	$\bar{x},x,1/3 [u,u,w]$
6 e .2'	$x,0,1/2 [u,2u,w]$	$0,x,1/6 [2u,u,\bar{w}]$	$\bar{x},\bar{x},5/6 [\bar{u},u,\bar{w}]$
	$\bar{x},0,1/2 [u,2u,\bar{w}]$	$0,\bar{x},1/6 [2u,u,w]$	$x,x,5/6 [\bar{u},u,w]$
6 d .2.	$x,0,0 [u,0,0]$	$0,x,2/3 [0,u,0]$	$\bar{x},\bar{x},1/3 [u,u,0]$
	$\bar{x},0,0 [u,0,0]$	$0,\bar{x},2/3 [0,u,0]$	$x,x,1/3 [u,u,0]$
6 c 2'..	$0,0,z [u,v,0]$	$0,0,z+2/3 [\bar{v},u-v,0]$	$0,0,z+1/3 [u-v,u,0]$
	$0,0,\bar{z}+2/3 [v,u,0]$	$0,0,\bar{z} [u-v,\bar{v},0]$	$0,0,\bar{z}+1/3 [u,u-v,0]$
3 b 2'2'2	$0,0,1/2 [u,2u,0]$	$0,0,1/6 [2u,u,0]$	$0,0,5/6 [\bar{u},u,0]$
3 a 2'2'2'	$0,0,0 [u,0,0]$	$0,0,2/3 [0,u,0]$	$0,0,1/3 [u,u,0]$

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $p_{2a^*}2'mm'$	Along [210] $p_{2a^*}2m'm'$
	$a^* = c$	$a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,1/6

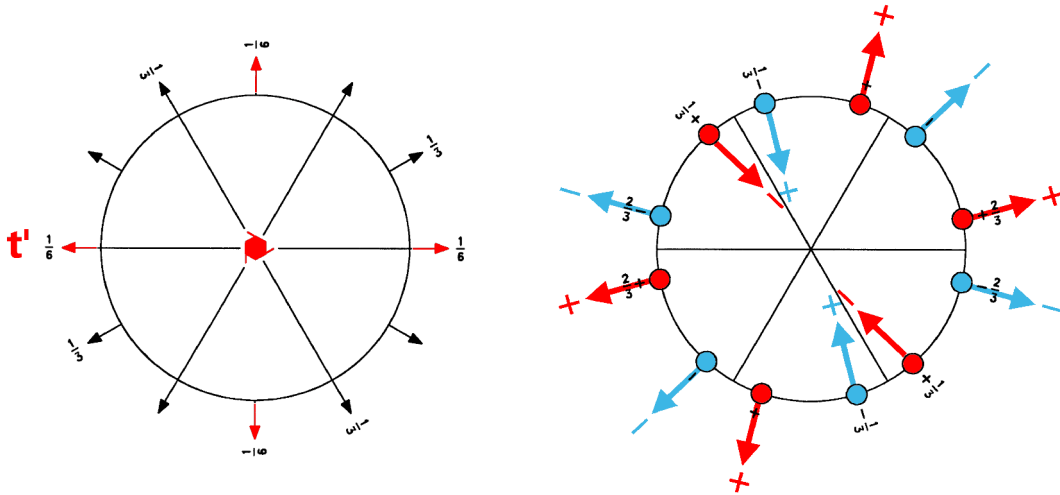
$p_{2c}6_2'22'$

6221'

Hexagonal

No. 64.6.326

$p_{2c}6_2'22'$



Origin on 222 at $6_2'(2,1,1)(1,2,1)$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) $3^+(0,0,2/3) \ 0,0,z$
(3_z 0,0,2/3) | (3) $3^-(0,0,1/3) \ 0,0,z$
(3_z^{-1} 0,0,1/3)' |
| (4) $2 \ 0,0,z$
(2_z 0,0,0) | (5) $6^-(0,0,2/3) \ 0,0,z$
(6_z^{-1} 0,0,2/3) | (6) $6^+(0,0,1/3) \ 0,0,z$
(6_z 0,0,1/3)' |
| (7) $2 \ x,x,1/3$
(2_{xy} 0,0,2/3) | (8) $2 \ x,0,0$
(2_x 0,0,0) | (9) $2' \ 0,y,1/6$
(2_y 0,0,1/3)' |
| (10) $2 \ x,\bar{x},1/3$
(2_3 0,0,2/3) | (11) $2 \ x,2x,0$
(2_2 0,0,0) | (12) $2' \ 2x,x,1/6$
(2_1 0,0,1/3)' |

For $(0,0,1)'$ + set

- | | | |
|---|---|---|
| (1) $t' (0,0,1)$
(1 0,0,1)' | (2) $3^{+'} (0,0,5/3) \ 0,0,z$
(3_z 0,0,5/3)' | (3) $3^- (0,0,4/3) \ 0,0,z$
(3_z^{-1} 0,0,4/3) |
| (4) $2' (0,0,1) \ 0,0,z$
(2_z 0,0,1)' | (5) $6^{+'} (0,0,5/3) \ 0,0,z$
(6_z^{-1} 0,0,5/3)' | (6) $6^+ (0,0,4/3) \ 0,0,z$
(6_z 0,0,4/3) |
| (7) $2' \ x,x,5/6$
(2_{xy} 0,0,5/3)' | (8) $2' \ x,0,1/2$
(2_x 0,0,1)' | (9) $2 \ 0,y,2/3$
(2_y 0,0,4/3) |
| (10) $2' \ x,\bar{x},5/6$
(2_3 0,0,5/3)' | (11) $2' \ x,2x,1/2$
(2_2 0,0,1)' | (12) $2 \ 2x,x,2/3$
(2_1 0,0,4/3) |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	(0,0,0)+ (0,0,1)' +		
		(0,0,0)+	(0,0,1)'	(0,0,0)+ (0,0,1)' +
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [u-v,u, \bar{w}]	
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+2/3$ [v, $\bar{u}+v,w$]	(6) $x-y,x,z+1/3$ [$\bar{u}+v,\bar{u},\bar{w}$]	
	(7) $y,x,\bar{z}+2/3$ [v,u, \bar{w}]	(8) $x-y,\bar{y},\bar{z}$ [u-v, \bar{v},\bar{w}]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/3$ [u,u-v,w]	
	(10) $\bar{y},\bar{x},\bar{z}+2/3$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/3$ [$\bar{u},\bar{u}+v,w$]	
6 g ..2'	$x,2x,1/2$ [u,0,w]	$2\bar{x},\bar{x},1/6$ [0, \bar{u},\bar{w}]	$x,\bar{x},5/6$ [u,u, \bar{w}]	
	$\bar{x},2\bar{x},1/2$ [$\bar{u},0,w$]	$2x,x,1/6$ [0,u, \bar{w}]	$\bar{x},x,5/6$ [\bar{u},\bar{u},\bar{w}]	
6 f ..2	$x,2x,0$ [u,2u,0]	$2\bar{x},\bar{x},2/3$ [2 $\bar{u},\bar{u},0$]	$x,\bar{x},1/3$ [$\bar{u},u,0$]	
	$\bar{x},2\bar{x},0$ [2 $\bar{u},\bar{u},0$]	$2x,x,2/3$ [u,2u,0]	$\bar{x},x,1/3$ [u, $\bar{u},0$]	
6 e .2'	$x,0,1/2$ [u,2u,w]	$0,x,1/6$ [2u,u, \bar{w}]	$\bar{x},\bar{x},5/6$ [\bar{u},u,\bar{w}]	
	$\bar{x},0,1/2$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},1/6$ [2 \bar{u},\bar{u},\bar{w}]	$x,x,5/6$ [u, \bar{u},\bar{w}]	
6 d .2.	$x,0,0$ [u,0,0]	$0,x,2/3$ [0,u,0]	$\bar{x},\bar{x},1/3$ [u,u,0]	
	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,\bar{x},2/3$ [0, $\bar{u},0$]	$x,x,1/3$ [$\bar{u},\bar{u},0$]	
6 c 2..	$0,0,z$ [0,0,w]	$0,0,z+2/3$ [0,0,w]	$0,0,z+1/3$ [0,0,w]	
	$0,0,\bar{z}+2/3$ [0,0, \bar{w}]	$0,0,\bar{z}$ [0,0, \bar{w}]	$0,0,\bar{z}+1/3$ [0,0, \bar{w}]	
3 b 22'2'	$0,0,1/2$ [0,0,w]	$0,0,1/6$ [0,0, \bar{w}]	$0,0,5/6$ [0,0, \bar{w}]	
3 a 222	$0,0,0$ [0,0,0]	$0,0,2/3$ [0,0,0]	$0,0,1/3$ [0,0,0]	

Continued

No. 64.6.326

$p_{2c} 6_2 '22'$

Symmetry of special projections

Along [001] $6mm1'$

Origin at 0,0,z

Along [100] $p_{2a^*} 2mm$

$a^* = c$

Origin at x,0,0

Along [210] $p_{2a^*} 2'm'm$

$a^* = c$

Origin at x,x/2,1/6

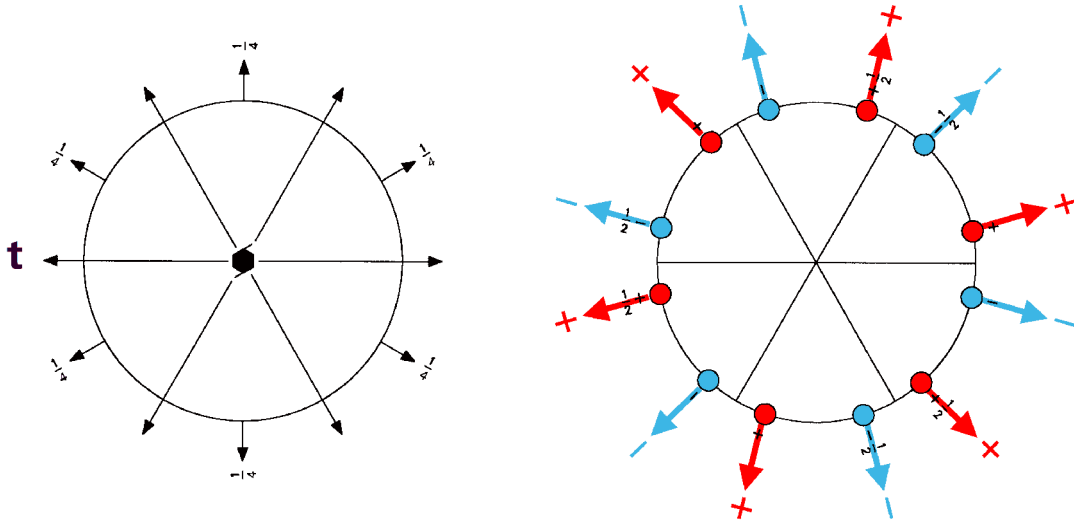
$p6_3 22$

622

Hexagonal

No. 65.1.327

$p6_3 22$



Origin at 321 at $6_3 21$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/2$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/2$ [$u-v,u,w$]
	(7) y,x,\bar{z} [v,u,\bar{w}]	(8) $x-y,\bar{y},\bar{z}$ [$u-v,\bar{v},\bar{w}$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/2$ [$u,u-v,\bar{w}$]
6 e ..2	$x,2x,1/4$ [$u,2u,0$]	$2\bar{x},\bar{x},1/4$ [$2\bar{u},\bar{u},0$]	$x,\bar{x},1/4$ [$u,\bar{u},0$]
	$\bar{x},2\bar{x},3/4$ [$\bar{u},2\bar{u},0$]	$2x,x,3/4$ [$2u,u,0$]	$\bar{x},x,3/4$ [$\bar{u},u,0$]
6 d .2.	$x,0,0$ [$u,0,0$]	$0,x,0$ [$0,u,0$]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]
	$\bar{x},0,1/2$ [$\bar{u},0,0$]	$0,\bar{x},1/2$ [$0,\bar{u},0$]	$x,x,1/2$ [$u,u,0$]
4 c 3..	$0,0,z$ [$0,0,w$]	$0,0,z+1/2$ [$0,0,w$]	
	$0,0,\bar{z}$ [$0,0,\bar{w}$]	$0,0,\bar{z}+1/2$ [$0,0,\bar{w}$]	
2 b 3.2	$0,0,1/4$ [$0,0,0$]	$0,0,3/4$ [$0,0,0$]	
2 a 32.	$0,0,0$ [$0,0,0$]	$0,0,1/2$ [$0,0,0$]	

Symmetry of special projections

Along [001] 6m'm'	Along [100] p2m'g'	Along [210] p2m'g'
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}$ Origin at x,x/2,1/4

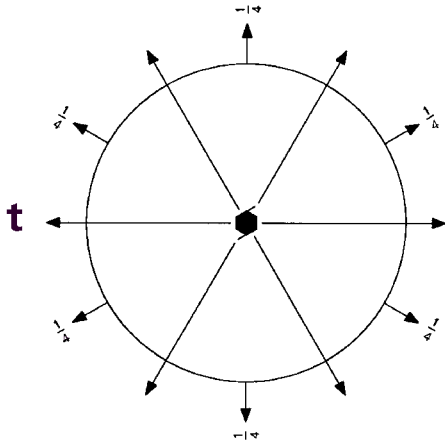
$p6_3221'$

$6221'$

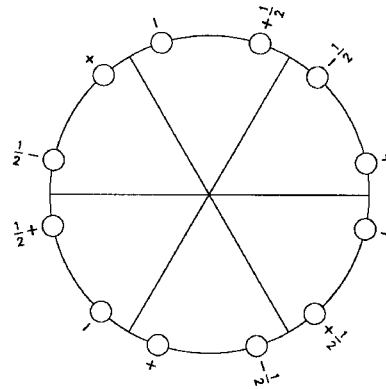
Hexagonal

No. 65.2.328

$p6_3221'$



1'



Origin at $3211'$ at $6_3211'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

For 1 + set

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |

For 1' + set

- | | | |
|---|---|--|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) $6^{-'}$ (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) $6^{+'}$ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (12) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1'+
12 f 11'	(1) x,y,z [0,0,0] (4) $\bar{x},\bar{y},z+1/2$ [0,0,0] (7) y,x,\bar{z} [0,0,0] (10) $\bar{y},\bar{x},\bar{z}+1/2$ [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0] (5) $y,\bar{x}+y,z+1/2$ [0,0,0] (8) $x-y,\bar{y},\bar{z}$ [0,0,0] (11) $\bar{x}+y,y,\bar{z}+1/2$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0] (6) $x-y,x,z+1/2$ [0,0,0] (9) $\bar{x},\bar{x}+y,\bar{z}$ [0,0,0] (12) $x,x-y,\bar{z}+1/2$ [0,0,0]
6 e ..21'	$x,2x,1/4$ [0,0,0] $\bar{x},2\bar{x},3/4$ [0,0,0]	$2\bar{x},\bar{x},1/4$ [0,0,0] $2x,x,3/4$ [0,0,0]	$x,\bar{x},1/4$ [0,0,0] $\bar{x},x,3/4$ [0,0,0]
6 d .2.1'	$x,0,0$ [0,0,0] $\bar{x},0,1/2$ [0,0,0]	$0,x,0$ [0,0,0] $0,\bar{x},1/2$ [0,0,0]	$\bar{x},\bar{x},0$ [0,0,0] $x,x,1/2$ [0,0,0]
4 c 3..1'	$0,0,z$ [0,0,0] $0,0,\bar{z}$ [0,0,0]	$0,0,z+1/2$ [0,0,0] $0,0,\bar{z}+1/2$ [0,0,0]	
2 b 3.21'	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]	
2 a 32.1'	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	

Symmetry of special projections

Along [001] $6mm1'$ Origin at 0,0,z	Along [100] $p2mg1'$ $a^* = c$ Origin at $x,0,0$	Along [210] $p2mg1'$ $a^* = c$ Origin at $x,x/2,1/4$
--	--	--

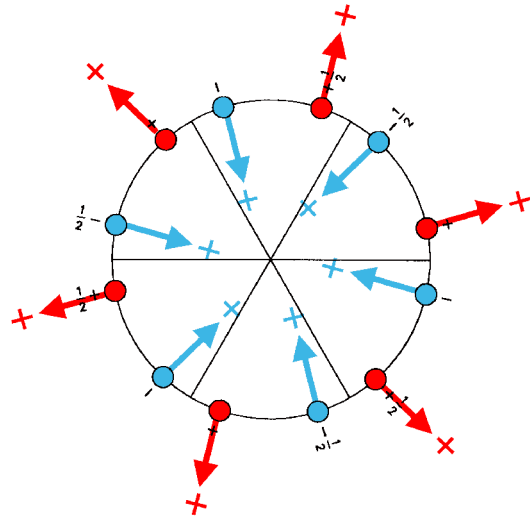
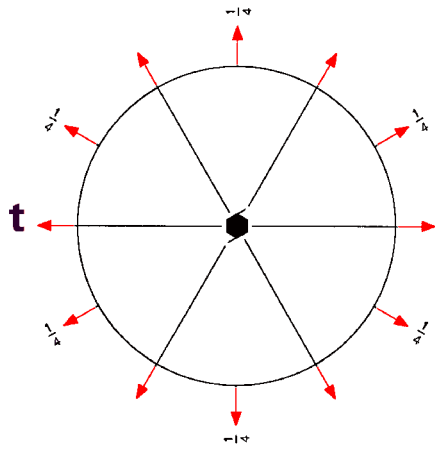
$p6_32'2'$

$62'2'$

Hexagonal

No. 65.3.329

$p6_32'2'$



Origin at $32'1$ at $6_32'1$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (12) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/2$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/2$ [u-v,u,w]
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [u,u-v,w]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [u-v, \bar{v},w]	(12) $x,x-y,\bar{z}+1/2$ [$\bar{u},\bar{u}+v,w$]
6 e ..2'	$x,2x,1/4$ [u,0,w]	$2\bar{x},\bar{x},1/4$ [0,u,w]	$x,\bar{x},1/4$ [\bar{u},\bar{u},w]
	$\bar{x},2\bar{x},3/4$ [$\bar{u},0,w$]	$2x,x,3/4$ [0, \bar{u},w]	$\bar{x},x,3/4$ [u,u,w]
6 d .2'	$x,0,0$ [u,2u,w]	$0,x,0$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},0$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},1/2$ [2u,u,w]	$x,x,1/2$ [\bar{u},u,w]
4 c 3..	$0,0,z$ [0,0,w]	$0,0,z+1/2$ [0,0,w]	
	$0,0,\bar{z}$ [0,0,w]	$0,0,\bar{z}+1/2$ [0,0,w]	
2 b 3.2'	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0,w]	
2 a 32'	$0,0,0$ [0,0,w]	$0,0,1/2$ [0,0,w]	

Symmetry of special projections

Along [001] 6mm	Along [100] $\rho 2'mg'$	Along [210] $\rho 2'mg'$
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}$ Origin at x,x/2,1/4

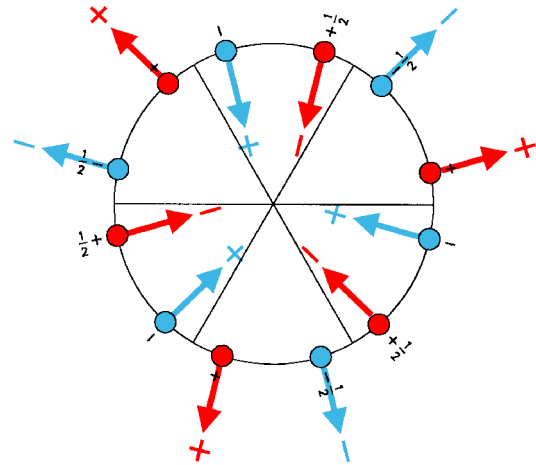
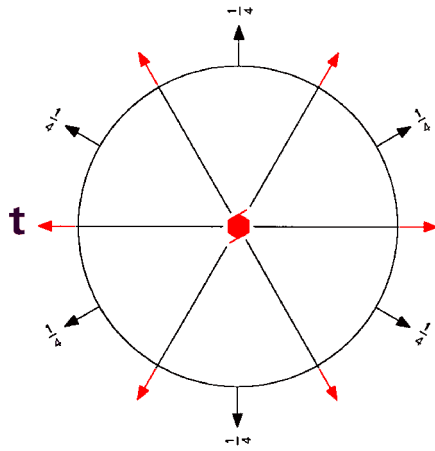
$p6_3'2'2'$

$6'2'2'$

Hexagonal

No. 65.4.330

$p6_3'2'2'$



Origin at $32'1'$ at $6_3'2'1'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [u,v,\bar{w}]	(5) $y,\bar{x}+y,z+1/2$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [$u,u-v,w$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/2$ [$u,u-v,\bar{w}$]
6 e ..2	$x,2x,1/4$ [$u,2u,0$]	$2\bar{x},\bar{x},1/4$ [$2\bar{u},\bar{u},0$]	$x,\bar{x},1/4$ [$u,\bar{u},0$]
	$\bar{x},2\bar{x},3/4$ [$u,2u,0$]	$2x,x,3/4$ [$2\bar{u},\bar{u},0$]	$\bar{x},x,3/4$ [$u,\bar{u},0$]
6 d .2'	$x,0,0$ [$u,2u,w$]	$0,x,0$ [$2\bar{u},\bar{u},w$]	$\bar{x},\bar{x},0$ [u,\bar{u},w]
	$\bar{x},0,1/2$ [$u,2u,\bar{w}$]	$0,\bar{x},1/2$ [$2\bar{u},\bar{u},\bar{w}$]	$x,x,1/2$ [u,\bar{u},\bar{w}]
4 c 3..	$0,0,z$ [$0,0,w$]	$0,0,z+1/2$ [$0,0,\bar{w}$]	
	$0,0,\bar{z}$ [$0,0,w$]	$0,0,\bar{z}+1/2$ [$0,0,\bar{w}$]	
2 b 3.2	$0,0,1/4$ [$0,0,0$]	$0,0,3/4$ [$0,0,0$]	
2 a 32'	$0,0,0$ [$0,0,w$]	$0,0,1/2$ [$0,0,\bar{w}$]	

Symmetry of special projections

Along [001] $6'm'm$	Along [100] $p2'm'g$	Along [210] $p2mg$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,1/4$

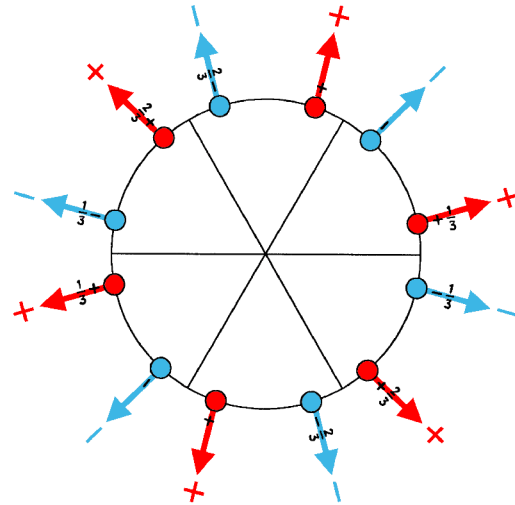
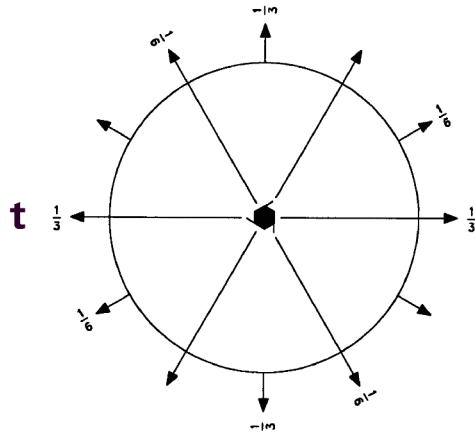
$p6_422$

622

Hexagonal

No. 66.1.331

$p6_422$



Origin on 222 at $6_4(2,1,1)(1,2,1)$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,1/3) 0,0,z
(3_z 0,0,1/3) | (3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} 0,0,2/3) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- (0,0,1/3) 0,0,z
(6_z^{-1} 0,0,1/3) | (6) 6^+ (0,0,2/3) 0,0,z
(6_z 0,0,2/3) |
| (7) 2 x,x,1/6
(2_{xy} 0,0,1/3) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,1/3
(2_y 0,0,2/3) |
| (10) 2 x, \bar{x} ,1/6
(2_3 0,0,1/3) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,1/3
(2_1 0,0,2/3) |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/3$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+2/3$ [$u-v,u,w$]
	(7) $y,x,\bar{z}+1/3$ [v,u,\bar{w}]	(8) $x-y,\bar{y},\bar{z}$ [$u-v,\bar{v},\bar{w}$]	(9) $\bar{x},\bar{x}+y,\bar{z}+2/3$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $\bar{y},\bar{x},\bar{z}+1/3$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+2/3$ [$u,u-v,\bar{w}$]
6 g ..2	$x,2x,1/2$ [u,2u,0]	$2\bar{x},\bar{x},5/6$ [$2\bar{u},\bar{u},0$]	$x,\bar{x},1/6$ [u, \bar{u} ,0]
	$\bar{x},2\bar{x},1/2$ [$\bar{u},2\bar{u},0$]	$2x,x,5/6$ [$2u,u,0$]	$\bar{x},x,1/6$ [$\bar{u},u,0$]
6 f ..2	$x,2x,0$ [u,2u,0]	$2\bar{x},\bar{x},1/3$ [$2\bar{u},\bar{u},0$]	$x,\bar{x},2/3$ [u, \bar{u} ,0]
	$\bar{x},2\bar{x},0$ [$\bar{u},2\bar{u},0$]	$2x,x,1/3$ [$2u,u,0$]	$\bar{x},x,2/3$ [$\bar{u},u,0$]
6 e .2.	$x,0,1/2$ [u,0,0]	$0,x,5/6$ [0,u,0]	$\bar{x},\bar{x},1/6$ [$\bar{u},\bar{u},0$]
	$\bar{x},0,1/2$ [$\bar{u},0,0$]	$0,\bar{x},5/6$ [0, \bar{u} ,0]	$x,x,1/6$ [u,u,0]
6 d .2.	$x,0,0$ [u,0,0]	$0,x,1/3$ [0,u,0]	$\bar{x},\bar{x},2/3$ [$\bar{u},\bar{u},0$]
	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,\bar{x},1/3$ [0, \bar{u} ,0]	$x,x,2/3$ [u,u,0]
6 c 2..	$0,0,z$ [0,0,w]	$0,0,z+1/3$ [0,0,w]	$0,0,z+2/3$ [0,0,w]
	$0,0,\bar{z}+1/3$ [0,0, \bar{w}]	$0,0,\bar{z}$ [0,0, \bar{w}]	$0,0,\bar{z}+2/3$ [0,0, \bar{w}]
3 b 222	$0,0,1/2$ [0,0,0]	$0,0,5/6$ [0,0,0]	$0,0,1/6$ [0,0,0]
3 a 222	$0,0,0$ [0,0,0]	$0,0,1/3$ [0,0,0]	$0,0,2/3$ [0,0,0]

Symmetry of special projectionsAlong [001] $6m'm'$

Origin at 0,0,z

Along [100] $p2m'm'$ $a^* = c$

Origin at x,0,0

Along [210] $p2m'm'$ $a^* = c$

Origin at x,x/2,1/3

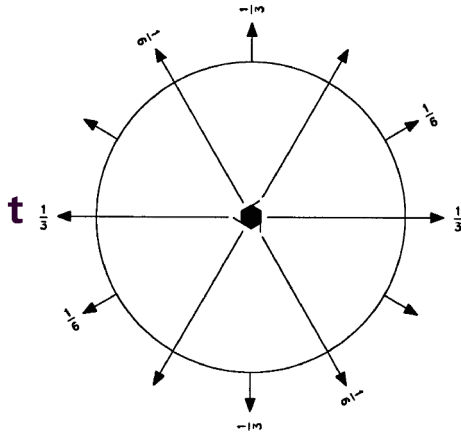
$p6_4221'$

$6221'$

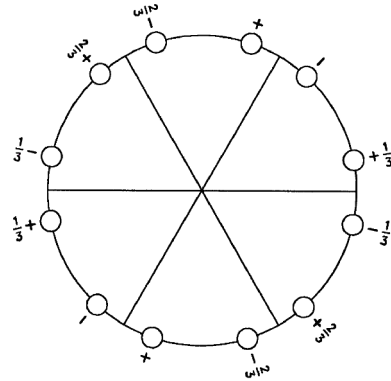
Hexagonal

No. 66.2.332

$p6_4221'$



$1'$



Origin on $2221'$ at $6_4(2,1,1)(1,2,1)1'$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

For $1 + \text{set}$

- | | | |
|---|--|--|
| (1) 1
($1 0,0,0$) | (2) $3^+(0,0,1/3) 0,0,z$
($3_z 0,0,1/3$) | (3) $3^-(0,0,2/3) 0,0,z$
($3_z^{-1} 0,0,2/3$) |
| (4) $2 0,0,z$
($2_z 0,0,0$) | (5) $6^-(0,0,1/3) 0,0,z$
($6_z^{-1} 0,0,1/3$) | (6) $6^+(0,0,2/3) 0,0,z$
($6_z 0,0,2/3$) |
| (7) $2 x,x,1/6$
($2_{xy} 0,0,1/3$) | (8) $2 x,0,0$
($2_x 0,0,0$) | (9) $2 0,y,1/3$
($2_y 0,0,2/3$) |
| (10) $2 x,\bar{x},1/6$
($2_3 0,0,1/3$) | (11) $2 x,2x,0$
($2_2 0,0,0$) | (12) $2 2x,x,1/3$
($2_1 0,0,2/3$) |

For $1' + \text{set}$

- | | | |
|---|--|--|
| (1) $1'$
($1 0,0,0$)' | (2) $3^{+'}(0,0,1/3) 0,0,z$
($3_z 0,0,1/3$)' | (3) $3^{-'}(0,0,2/3) 0,0,z$
($3_z^{-1} 0,0,2/3$)' |
| (4) $2'$ $0,0,z$
($2_z 0,0,0$)' | (5) $6^{-'}(0,0,1/3) 0,0,z$
($6_z^{-1} 0,0,1/3$)' | (6) $6^{+'}(0,0,2/3) 0,0,z$
($6_z 0,0,2/3$)' |
| (7) $2'$ $x,x,1/6$
($2_{xy} 0,0,1/3$)' | (8) $2'$ $x,0,0$
($2_x 0,0,0$)' | (9) $2'$ $0,y,1/3$
($2_y 0,0,2/3$)' |
| (10) $2'$ $x,\bar{x},1/6$
($2_3 0,0,1/3$)' | (11) $2'$ $x,2x,0$
($2_2 0,0,0$)' | (12) $2'$ $2x,x,1/3$
($2_1 0,0,2/3$)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1'+
12 h 11'	(1) x,y,z [0,0,0] (4) \bar{x},\bar{y},z [0,0,0] (7) $y,x,\bar{z}+1/3$ [0,0,0] (10) $\bar{y},\bar{x},\bar{z}+1/3$ [0,0,0]	(2) $\bar{y},x-y,z+1/3$ [0,0,0] (5) $y,\bar{x}+y,z+1/3$ [0,0,0] (8) $x-y,\bar{y},\bar{z}$ [0,0,0] (11) $\bar{x}+y,y,\bar{z}$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+2/3$ [0,0,0] (6) $x-y,x,z+2/3$ [0,0,0] (9) $\bar{x},\bar{x}+y,\bar{z}+2/3$ [0,0,0] (12) $x,x-y,\bar{z}+2/3$ [0,0,0]
6 g ..21'	$x,2x,1/2$ [0,0,0] $\bar{x},2\bar{x},1/2$ [0,0,0]	$2\bar{x},\bar{x},5/6$ [0,0,0] $2x,x,5/6$ [0,0,0]	$x,\bar{x},1/6$ [0,0,0] $\bar{x},x,1/6$ [0,0,0]
6 f ..21'	$x,2x,0$ [0,0,0] $\bar{x},2\bar{x},0$ [0,0,0]	$2\bar{x},\bar{x},1/3$ [0,0,0] $2x,x,1/3$ [0,0,0]	$x,\bar{x},2/3$ [0,0,0] $\bar{x},x,2/3$ [0,0,0]
6 e .2.1'	$x,0,1/2$ [0,0,0] $\bar{x},0,1/2$ [0,0,0]	$0,x,5/6$ [0,0,0] $0,\bar{x},5/6$ [0,0,0]	$\bar{x},\bar{x},1/6$ [0,0,0] $x,x,1/6$ [0,0,0]
6 d .2.1'	$x,0,0$ [0,0,0] $\bar{x},0,0$ [0,0,0]	$0,x,1/3$ [0,0,0] $0,\bar{x},1/3$ [0,0,0]	$\bar{x},\bar{x},2/3$ [0,0,0] $x,x,2/3$ [0,0,0]
6 c 2..1'	$0,0,z$ [0,0,0] $0,0,\bar{z}+1/3$ [0,0,0]	$0,0,z+1/3$ [0,0,0] $0,0,\bar{z}$ [0,0,0]	$0,0,z+2/3$ [0,0,0] $0,0,\bar{z}+2/3$ [0,0,0]
3 b 2221'	$0,0,1/2$ [0,0,0]	$0,0,5/6$ [0,0,0]	$0,0,1/6$ [0,0,0]
3 a 2221'	$0,0,0$ [0,0,0]	$0,0,1/3$ [0,0,0]	$0,0,2/3$ [0,0,0]

Symmetry of special projectionsAlong [001] $6mm1'$

Origin at 0,0,z

Along [100] $\rho 2mm1'$ $a^* = c$

Origin at x,0,0

Along [210] $\rho 2mm1'$ $a^* = c$

Origin at x,x/2,1/3

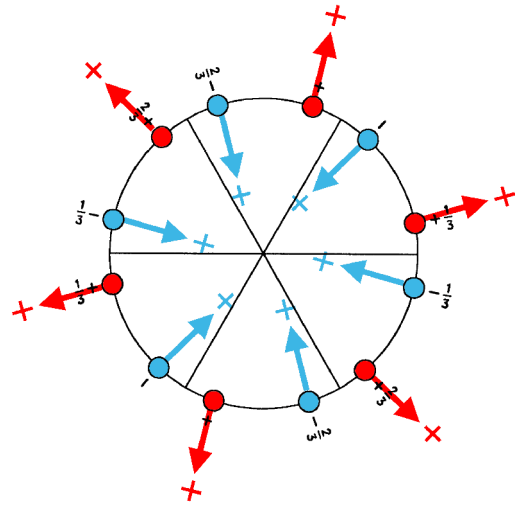
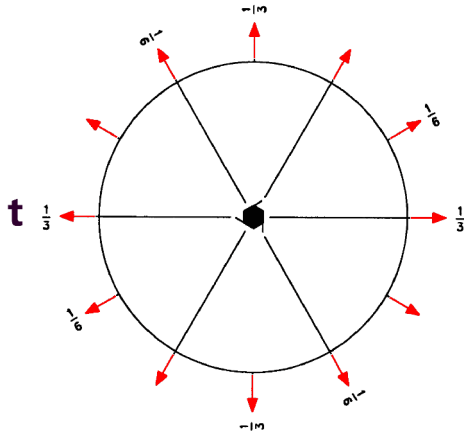
$p6_42'2'$

$62'2'$

Hexagonal

No. 66.3.333

$p6_42'2'$



Origin on $2'2'2'$ at $6_4(2',1,1)(1,2',1)$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,1/3) 0,0,z
(3_z 0,0,1/3) | (3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} 0,0,2/3) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- (0,0,1/3) 0,0,z
(6_z^{-1} 0,0,1/3) | (6) 6^+ (0,0,2/3) 0,0,z
(6_z 0,0,2/3) |
| (7) $2'$ x,x,1/6
(2_{xy} 0,0,1/3)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,1/3
(2_y 0,0,2/3)' |
| (10) $2'$ x, \bar{x} ,1/6
(2_3 0,0,1/3)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,1/3
(2_1 0,0,2/3)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/3$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+2/3$ [$u-v,u,w$]
	(7) $y,x,\bar{z}+1/3$ [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+2/3$ [$u,u-v,w$]
	(10) $\bar{y},\bar{x},\bar{z}+1/3$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}$ [$u-v,\bar{v},w$]	(12) $x,x-y,\bar{z}+2/3$ [$\bar{u},\bar{u}+v,w$]
6 g ..2'	$x,2x,1/2$ [u,0,w]	$2\bar{x},\bar{x},5/6$ [0,u,w]	$x,\bar{x},1/6$ [\bar{u},\bar{u},w]
	$\bar{x},2\bar{x},1/2$ [$\bar{u},0,w$]	$2x,x,5/6$ [0, \bar{u},w]	$\bar{x},x,1/6$ [u,u,w]
6 f ..2'	$x,2x,0$ [u,0,w]	$2\bar{x},\bar{x},1/3$ [0,u,w]	$x,\bar{x},2/3$ [\bar{u},\bar{u},w]
	$\bar{x},2\bar{x},0$ [$\bar{u},0,w$]	$2x,x,1/3$ [0, \bar{u},w]	$\bar{x},x,2/3$ [u,u,w]
6 e .2'	$x,0,1/2$ [u,2u,w]	$0,x,5/6$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},1/6$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},5/6$ [2u,u,w]	$x,x,1/6$ [\bar{u},u,w]
6 d .2'	$x,0,0$ [u,2u,w]	$0,x,1/3$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},2/3$ [u, \bar{u},w]
	$\bar{x},0,0$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},1/3$ [2u,u,w]	$x,x,2/3$ [\bar{u},u,w]
6 c 2..	$0,0,z$ [0,0,w]	$0,0,z+1/3$ [0,0,w]	$0,0,z+2/3$ [0,0,w]
	$0,0,\bar{z}+1/3$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	$0,0,\bar{z}+2/3$ [0,0,w]
3 b 2'2'	$0,0,1/2$ [0,0,w]	$0,0,5/6$ [0,0,w]	$0,0,1/6$ [0,0,w]
3 a 2'2'	$0,0,0$ [0,0,w]	$0,0,1/3$ [0,0,w]	$0,0,2/3$ [0,0,w]

Continued

No. 66.3.333

$p6_4 2'2'$

Symmetry of special projections

Along [001] $6mm$

Origin at $0,0,z$

Along [100] $p2'mm'$

$a^* = c$

Origin at $x,0,0$

Along [210] $p2'mm'$

$a^* = c$

Origin at $x,x/2,1/3$

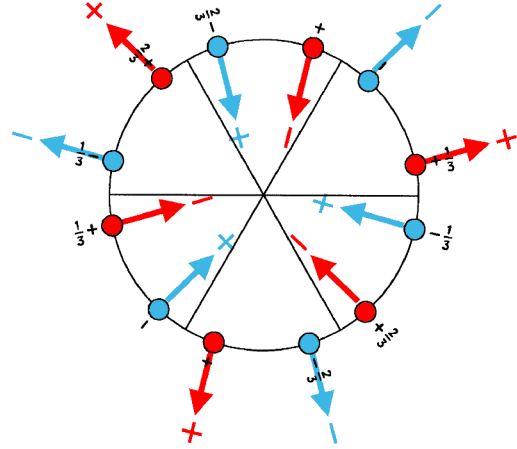
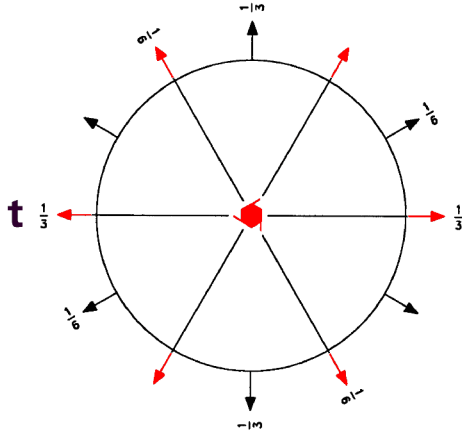
$p6_4'2'2'$

$6'2'2'$

Hexagonal

No. 66.4.334

$p6_4'2'2'$



Origin on $2'2'2'$ at $6_4'(2',1,1)(1,2,1)$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,1/3) 0,0,z
(3_z 0,0,1/3) | (3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} 0,0,2/3) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- (0,0,1/3) 0,0,z
(6_z^{-1} 0,0,1/3)' | (6) 6^+ (0,0,2/3) 0,0,z
(6_z 0,0,2/3)' |
| (7) $2'$ x,x,1/6
(2_{xy} 0,0,1/3)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,1/3
(2_y 0,0,2/3)' |
| (10) 2 x, \bar{x} ,1/6
(2_3 0,0,1/3) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,1/3
(2_1 0,0,2/3) |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v, \bar{w}]	(5) $y,\bar{x}+y,z+1/3$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+2/3$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) $y,x,\bar{z}+1/3$ [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+2/3$ [u,u-v,w]
	(10) $\bar{y},\bar{x},\bar{z}+1/3$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+2/3$ [u,u-v, \bar{w}]
6 g ..2	$x,2x,1/2$ [u,2u,0]	$2\bar{x},\bar{x},5/6$ [2 $\bar{u},\bar{u},0$]	$x,\bar{x},1/6$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},1/2$ [u,2u,0]	$2x,x,5/6$ [2 $\bar{u},\bar{u},0$]	$\bar{x},x,1/6$ [u, $\bar{u},0$]
6 f ..2	$x,2x,0$ [u,2u,0]	$2\bar{x},\bar{x},1/3$ [2 $\bar{u},\bar{u},0$]	$x,\bar{x},2/3$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},0$ [u,2u,0]	$2x,x,1/3$ [2 $\bar{u},\bar{u},0$]	$\bar{x},x,2/3$ [u, $\bar{u},0$]
6 e .2'	$x,0,1/2$ [u,2u,w]	$0,x,5/6$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},1/6$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [u,2u, \bar{w}]	$0,\bar{x},5/6$ [2 \bar{u},\bar{u},\bar{w}]	$x,x,1/6$ [u, \bar{u},\bar{w}]
6 d .2'	$x,0,0$ [u,2u,w]	$0,x,1/3$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},2/3$ [u, \bar{u},w]
	$\bar{x},0,0$ [u,2u, \bar{w}]	$0,\bar{x},1/3$ [2 \bar{u},\bar{u},\bar{w}]	$x,x,2/3$ [u, \bar{u},\bar{w}]
6 c 2'..	$0,0,z$ [u,v,0]	$0,0,z+1/3$ [$\bar{v},u-v,0$]	$0,0,z+2/3$ [$\bar{u}+v,\bar{u},0$]
	$0,0,\bar{z}+1/3$ [$\bar{v},\bar{u},0$]	$0,0,\bar{z}$ [$\bar{u}+v,v,0$]	$0,0,\bar{z}+2/3$ [u,u-v,0]
3 b 2'2'2	$0,0,1/2$ [u,2u,0]	$0,0,5/6$ [2 $\bar{u},\bar{u},0$]	$0,0,1/6$ [u, $\bar{u},0$]
3 a 2'2'2	$0,0,0$ [u,2u,0]	$0,0,1/3$ [2 $\bar{u},\bar{u},0$]	$0,0,2/3$ [u, $\bar{u},0$]

Symmetry of special projections

Along [001] $6'mm'$

Origin at 0,0,z

Along [100] $p2'm'm$ $a^* = c$

Origin at x,0,0

Along [210] $p2mm$ $a^* = c$

Origin at x,x/2,1/3

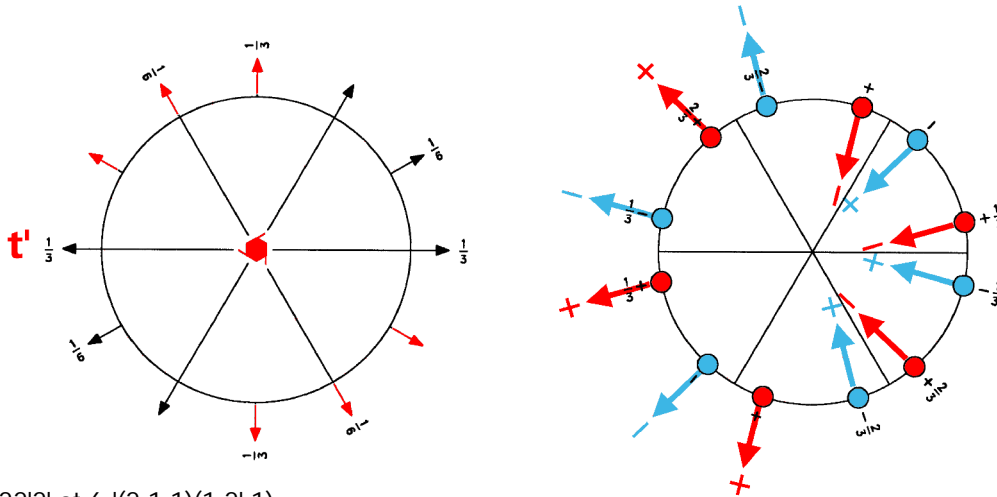
$p_{2c}6_4'22'$

6221'

Hexagonal

No. 66.5.335

$p_{2c}6_4'22'$



Origin on 22'2' at $6_4'(2,1,1)(1,2',1)$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

For (0,0,0) + set

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,1/3) 0,0,z
(3_z 0,0,1/3)' | (3) 3^- (0,0,2/3) 0,0,z
(3_z^{-1} 0,0,2/3) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- (0,0,1/3) 0,0,z
(6_z^{-1} 0,0,1/3) | (6) 6^+ (0,0,2/3) 0,0,z
(6_z 0,0,2/3)' |
| (7) $2'$ x,x,1/6
(2_{xy} 0,0,1/3)' | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,1/3
(2_y 0,0,2/3) |
| (10) 2 x, \bar{x} ,1/6
(2_3 0,0,1/3) | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,1/3
(2_1 0,0,2/3)' |

For (0,01)' + set

- | | | |
|---|--|--|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 3^+ (0,0,4/3) 0,0,z
(3_z 0,0,4/3) | (3) 3^- (0,0,5/3) 0,0,z
(3_z^{-1} 0,0,5/3)' |
| (4) 2 (0,0,1) 0,0,z
(2_z 0,0,1) | (5) 6^- (0,0,4/3) 0,0,z
(6_z^{-1} 0,0,4/3)' | (6) 6^+ (0,0,5/3) 0,0,z
(6_z 0,0,5/3) |
| (7) 2 x,x,2/3
(2_{xy} 0,0,4/3) | (8) $2'$ x,0,1/2
(2_x 0,0,1)' | (9) $2'$ 0,y,5/6
(2_y 0,0,5/3)' |
| (10) $2'$ x, \bar{x} ,2/3
(2_3 0,0,4/3)' | (11) 2 x,2x,1/2
(2_2 0,0,1) | (12) 2 2x,x,5/6
(2_1 0,0,5/3) |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
12 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z+1/3 [v,\bar{u}+v,\bar{w}]$	(3) $\bar{x}+y,\bar{x},z+2/3 [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z+1/3 [v,\bar{u}+v,w]$	(6) $x-y,x,z+2/3 [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $y,x,\bar{z}+1/3 [\bar{v},\bar{u},w]$	(8) $x-y,\bar{y},\bar{z} [u-v,\bar{v},\bar{w}]$	(9) $\bar{x},\bar{x}+y,\bar{z}+2/3 [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $\bar{y},\bar{x},\bar{z}+1/3 [\bar{v},\bar{u},\bar{w}]$	(11) $\bar{x}+y,y,\bar{z} [u-v,\bar{v},w]$	(12) $x,x-y,\bar{z}+2/3 [\bar{u},\bar{u}+v,w]$
6 g ..2	$x,2x,1/2 [u,2u,0]$	$2\bar{x},\bar{x},5/6 [2u,u,0]$	$x,\bar{x},1/6 [\bar{u},u,0]$
	$\bar{x},2\bar{x},1/2 [u,2u,0]$	$2x,x,5/6 [2u,u,0]$	$\bar{x},x,1/6 [\bar{u},u,0]$
6 f ..2'	$x,2x,0 [u,0,w]$	$2\bar{x},\bar{x},1/3 [0,\bar{u},\bar{w}]$	$x,\bar{x},2/3 [\bar{u},\bar{u},w]$
	$\bar{x},2\bar{x},0 [u,0,\bar{w}]$	$2x,x,1/3 [0,\bar{u},\bar{w}]$	$\bar{x},x,2/3 [\bar{u},\bar{u},\bar{w}]$
6 e .2'	$x,0,1/2 [u,2u,w]$	$0,x,5/6 [2u,u,w]$	$\bar{x},\bar{x},1/6 [\bar{u},u,\bar{w}]$
	$\bar{x},0,1/2 [u,2u,\bar{w}]$	$0,\bar{x},5/6 [2u,u,\bar{w}]$	$x,x,1/6 [\bar{u},u,w]$
6 d .2.	$x,0,0 [u,0,0]$	$0,x,1/3 [0,\bar{u},0]$	$\bar{x},\bar{x},2/3 [\bar{u},\bar{u},0]$
	$\bar{x},0,0 [u,0,0]$	$0,\bar{x},1/3 [0,\bar{u},0]$	$x,x,2/3 [\bar{u},\bar{u},0]$
6 c 2'..	$0,0,z [u,v,0]$	$0,0,z+1/3 [v,\bar{u}+v,0]$	$0,0,z+2/3 [\bar{u}+v,\bar{u},0]$
	$0,0,\bar{z}+1/3 [\bar{v},\bar{u},0]$	$0,0,\bar{z} [u-v,\bar{v},0]$	$0,0,\bar{z}+2/3 [\bar{u},\bar{u}+v,0]$
3 b 2'2'2	$0,0,1/2 [u,2u,0]$	$0,0,5/6 [2u,u,0]$	$0,0,1/6 [\bar{u},u,0]$
3 a 2'22'	$0,0,0 [u,0,0]$	$0,0,1/3 [0,\bar{u},0]$	$0,0,2/3 [\bar{u},\bar{u},0]$

Continued

No. 66.5.335

$p_{2c} 6_4 '22'$

Symmetry of special projections

Along [001] $6mm1'$

Origin at 0,0,z

Along [100] $p_{2a^*} 2m'm'$

$a^* = c$

Origin at x,0,0

Along [210] $p_{2a^*} 2m'm'$

$a^* = c$

Origin at x,x/2,1/3

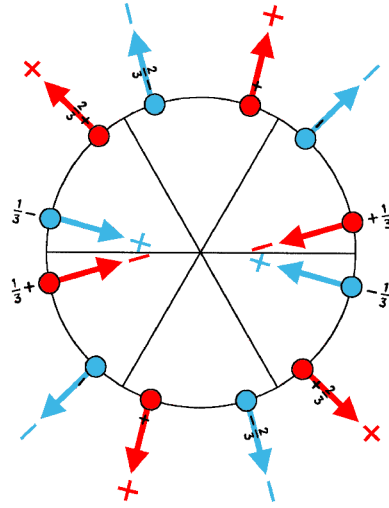
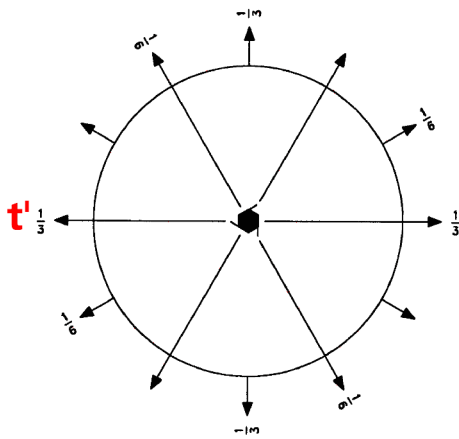
$p_{2c}6_422$

6221'

Hexagonal

No. 66.6.336

$p_{2c}6_422$



Origin on 222 at $6_4(2,1,1)(1,2,1)$

Asymmetric unit $0 \leq x: 0 \leq z \leq 1/6$

Symmetry operations

For (0,0,0) + set

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) $3^+ (0,0,1/3) \ 0,0,z$
(3_z 0,0,1/3)' | (3) $3^- (0,0,2/3) \ 0,0,z$
(3_z^{-1} 0,0,2/3) |
| (4) 2 $0,0,z$
(2_z 0,0,0) | (5) $6^- (0,0,1/3) \ 0,0,z$
(6_z^{-1} 0,0,1/3)' | (6) $6^+ (0,0,2/3) \ 0,0,z$
(6_z 0,0,2/3) |
| (7) $2' \ x,x,1/6$
(2_{xy} 0,0,1/3)' | (8) 2 $x,0,0$
(2_x 0,0,0) | (9) 2 $0,y,1/3$
(2_y 0,0,2/3) |
| (10) $2' \ x,\bar{x},1/6$
(2_3 0,0,1/3)' | (11) 2 $x,2x,0$
(2_2 0,0,0) | (12) 2 $2x,x,1/3$
(2_1 0,0,2/3) |

For (0,01)' + set

- | | | |
|--|---|--|
| (1) $t' (0,0,1)$
(1 0,0,1)' | (2) $3^+ (0,0,4/3) \ 0,0,z$
(3_z 0,0,4/3) | (3) $3^- (0,0,5/3) \ 0,0,z$
(3_z^{-1} 0,0,5/3)' |
| (4) $2' (0,0,1) \ 0,0,z$
(2_z 0,0,1)' | (5) $6^- (0,0,4/3) \ 0,0,z$
(6_z^{-1} 0,0,4/3) | (6) $6^+ (0,0,5/3) \ 0,0,z$
(6_z 0,0,5/3)' |
| (7) 2 $x,x,2/3$
(2_{xy} 0,0,4/3) | (8) $2' \ x,0,1/2$
(2_x 0,0,1)' | (9) $2' \ 0,y,5/6$
(2_y 0,0,5/3)' |
| (10) 2 $x,\bar{x},2/3$
(2_3 0,0,4/3) | (11) $2' \ x,2x,1/2$
(2_2 0,0,1)' | (12) $2' \ 2x,x,5/6$
(2_1 0,0,5/3)' |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+1/3$ [v, $\bar{u}+v,\bar{w}$]	(3) $\bar{x}+y,\bar{x},z+2/3$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/3$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+2/3$ [u-v,u,w]
	(7) $y,x,\bar{z}+1/3$ [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [u-v, \bar{v},\bar{w}]	(9) $\bar{x},\bar{x}+y,\bar{z}+2/3$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $\bar{y},\bar{x},\bar{z}+1/3$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+2/3$ [u,u-v, \bar{w}]
6 g ..2'	$x,2x,1/2$ [u,0,w]	$2\bar{x},\bar{x},5/6$ [0, \bar{u},\bar{w}]	$x,\bar{x},1/6$ [u,u, \bar{w}]
	$\bar{x},2\bar{x},1/2$ [$\bar{u},0,w$]	$2x,x,5/6$ [0,u, \bar{w}]	$\bar{x},x,1/6$ [\bar{u},\bar{u},\bar{w}]
6 f ..2	$x,2x,0$ [u,2u,0]	$2\bar{x},\bar{x},1/3$ [2u,u,0]	$x,\bar{x},2/3$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},0$ [$\bar{u},2\bar{u},0$]	$2x,x,1/3$ [2 $\bar{u},\bar{u},0$]	$\bar{x},x,2/3$ [$\bar{u},u,0$]
6 e .2'	$x,0,1/2$ [u,2u,w]	$0,x,5/6$ [2u,u, \bar{w}]	$\bar{x},\bar{x},1/6$ [\bar{u},u,\bar{w}]
	$\bar{x},0,1/2$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},5/6$ [2 \bar{u},\bar{u},w]	$x,x,1/6$ [u, \bar{u},\bar{w}]
6 d .2.	$x,0,0$ [u,0,0]	$0,x,1/3$ [0, $\bar{u},0$]	$\bar{x},\bar{x},2/3$ [$\bar{u},\bar{u},0$]
	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,\bar{x},1/3$ [0,u,0]	$x,x,2/3$ [u,u,0]
6 c 2..	$0,0,z$ [0,0,w]	$0,0,z+1/3$ [0,0, \bar{w}]	$0,0,z+2/3$ [0,0,w]
	$0,0,\bar{z}+1/3$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]	$0,0,\bar{z}+2/3$ [0,0, \bar{w}]
3 b 22'2'	$0,0,1/2$ [0,0,w]	$0,0,5/6$ [0,0, \bar{w}]	$0,0,1/6$ [0,0, \bar{w}]
3 a 222	$0,0,0$ [0,0,0]	$0,0,1/3$ [0,0,0]	$0,0,2/3$ [0,0,0]

Symmetry of special projections

Along [001] $6mm1'$

Origin at 0,0,z

Along [100] $p_{2a^*} 2m'm'$ $a^* = c$

Origin at x,0,0

Along [210] $p_{2a^*} 2m'm'$ $a^* = c$

Origin at x,x/2,1/3

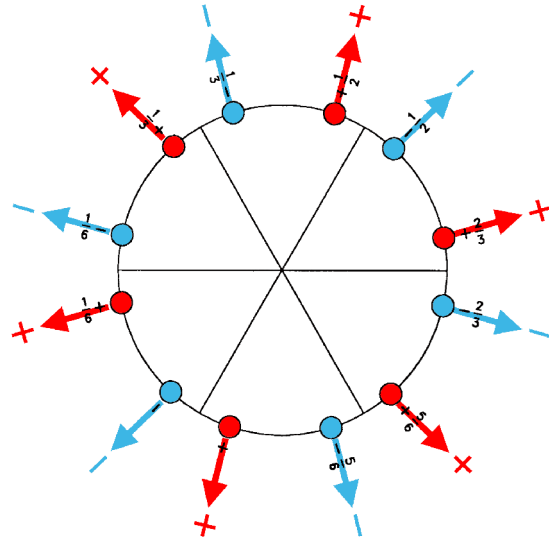
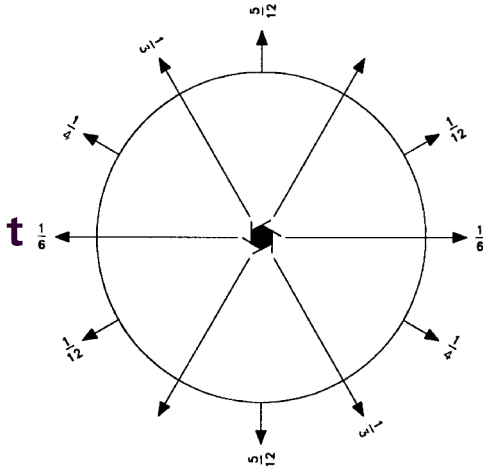
$p6_522$

622

Hexagonal

No. 67.1.337

$p6_522$



Origin on $2[100]$ at $6_5(2,1,1)$

Asymmetric unit $0 \leq z \leq 1/12$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,2/3) 0,0,z
(3_z 0,0,2/3) | (3) 3^- (0,0,1/3) 0,0,z
(3_z^{-1} 0,0,1/3) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/6) 0,0,z
(6_z^{-1} 0,0,1/6) | (6) 6^+ (0,0,5/6) 0,0,z
(6_z 0,0,5/6) |
| (7) 2 x,x,1/3
(2_{xy} 0,0,2/3) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,1/6
(2_y 0,0,1/3) |
| (10) 2 x, \bar{x} ,1/12
(2_3 0,0,1/6) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,5/12
(2_1 0,0,5/6) |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 c 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z+2/3$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z+1/3$ [$\bar{u}+v, \bar{u}, w$]
	(4) $\bar{x}, \bar{y}, z+1/2$ [\bar{u}, \bar{v}, w]	(5) $y, \bar{x}+y, z+1/6$ [$v, \bar{u}+v, w$]	(6) $x-y, x, z+5/6$ [$u-v, u, w$]
	(7) $y, x, \bar{z}+2/3$ [v, u, \bar{w}]	(8) $x-y, \bar{y}, \bar{z}$ [$u-v, \bar{v}, \bar{w}$]	(9) $\bar{x}, \bar{x}+y, \bar{z}+1/3$ [$\bar{u}, \bar{u}+v, \bar{w}$]
	(10) $\bar{y}, \bar{x}, \bar{z}+1/6$ [$\bar{v}, \bar{u}, \bar{w}$]	(11) $\bar{x}+y, y, \bar{z}+1/2$ [$\bar{u}+v, v, \bar{w}$]	(12) $x, x-y, \bar{z}+5/6$ [$u, u-v, \bar{w}$]
6 b ..2	$x, 2x, 3/4$ [u,2u,0]	$2\bar{x}, \bar{x}, 5/12$ [$2\bar{u}, \bar{u}, 0$]	$x, \bar{x}, 1/12$ [u, \bar{u} ,0]
	$\bar{x}, 2\bar{x}, 1/4$ [$\bar{u}, 2\bar{u}, 0$]	$2x, x, 11/12$ [$2u, u, 0$]	$\bar{x}, x, 7/12$ [$\bar{u}, u, 0$]
6 a .2.	$x, 0, 0$ [u,0,0]	$0, x, 2/3$ [0,u,0]	$\bar{x}, \bar{x}, 1/3$ [$\bar{u}, \bar{u}, 0$]
	$\bar{x}, 0, 1/2$ [$\bar{u}, 0, 0$]	$0, \bar{x}, 1/6$ [0, \bar{u} ,0]	$x, x, 5/6$ [u,u,0]

Symmetry of special projections

Along [001] 6m'm'	Along [100] p2m'g'	Along [210] p2m'g'
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,5/12

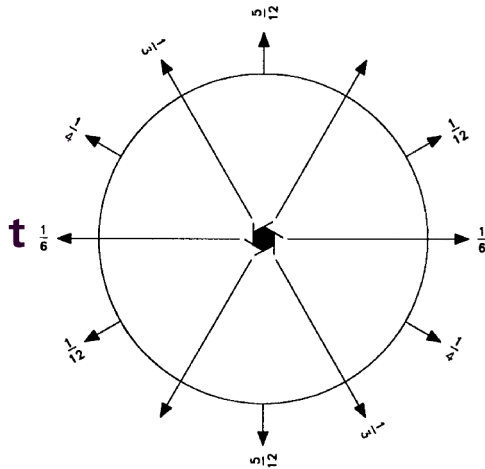
$p6_5221'$

$6221'$

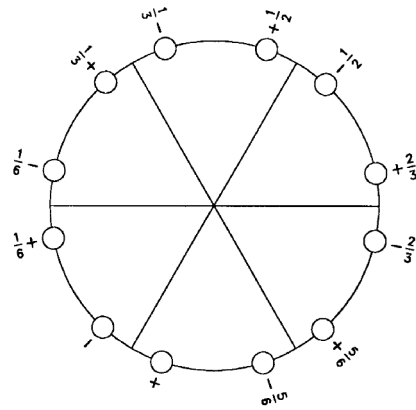
Hexagonal

No. 67.2.338

$p6_5221'$



$1'$



Origin on $2[100]1'$ at $6_5(2,1,1)11'$

Asymmetric unit $0 \leq z \leq 1/12$

Symmetry operations

For $1 +$ set

- | | | |
|--|--|--|
| (1) 1
($1 0,0,0$) | (2) $3^+(0,0,2/3) 0,0,z$
($3_z 0,0,2/3$) | (3) $3^-(0,0,1/3) 0,0,z$
($3_z^{-1} 0,0,1/3$) |
| (4) $2(0,0,1/2) 0,0,z$
($2_z 0,0,1/2$) | (5) $6^-(0,0,1/6) 0,0,z$
($6_z^{-1} 0,0,1/6$) | (6) $6^+(0,0,5/6) 0,0,z$
($6_z 0,0,5/6$) |
| (7) $2 x,x,1/3$
($2_{xy} 0,0,2/3$) | (8) $2 x,0,0$
($2_x 0,0,0$) | (9) $2 0,y,1/6$
($2_y 0,0,1/3$) |
| (10) $2 x,\bar{x},1/12$
($2_3 0,0,1/6$) | (11) $2 x,2x,1/4$
($2_2 0,0,1/2$) | (12) $2 2x,x,5/12$
($2_1 0,0,5/6$) |

For $1' +$ set

- | | | |
|--|--|--|
| (1) $1'$
($1 0,0,0$)' | (2) $3^{+'}(0,0,2/3) 0,0,z$
($3_z 0,0,2/3$)' | (3) $3^{-'}(0,0,1/3) 0,0,z$
($3_z^{-1} 0,0,1/3$)' |
| (4) $2'(0,0,1/2) 0,0,z$
($2_z 0,0,1/2$)' | (5) $6^{-'}(0,0,1/6) 0,0,z$
($6_z^{-1} 0,0,1/6$)' | (6) $6^{+'}(0,0,5/6) 0,0,z$
($6_z 0,0,5/6$)' |
| (7) $2' x,x,1/3$
($2_{xy} 0,0,2/3$)' | (8) $2' x,0,0$
($2_x 0,0,0$)' | (9) $2' 0,y,1/6$
($2_y 0,0,1/3$)' |
| (10) $2' x,\bar{x},1/12$
($2_3 0,0,1/6$)' | (11) $2' x,2x,1/4$
($2_2 0,0,1/2$)' | (12) $2' 2x,x,5/12$
($2_1 0,0,5/6$)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1'+
12 c 11'	(1) x,y,z [0,0,0] (4) $\bar{x},\bar{y},z+1/2$ [0,0,0] (7) $y,x,\bar{z}+2/3$ [0,0,0] (10) $\bar{y},\bar{x},\bar{z}+1/6$ [0,0,0]	(2) $\bar{y},x-y,z+2/3$ [0,0,0] (5) $y,\bar{x}+y,z+1/6$ [0,0,0] (8) $x-y,\bar{y},\bar{z}$ [0,0,0] (11) $\bar{x}+y,y,\bar{z}+1/2$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z+1/3$ [0,0,0] (6) $x-y,x,z+5/6$ [0,0,0] (9) $\bar{x},\bar{x}+y,\bar{z}+1/3$ [0,0,0] (12) $x,x-y,\bar{z}+5/6$ [0,0,0]
6 b ..21'	$x,2x,3/4$ [0,0,0] $\bar{x},2\bar{x},1/4$ [0,0,0]	$2\bar{x},\bar{x},5/12$ [0,0,0] $2x,x,11/12$ [0,0,0]	$x,\bar{x},1/12$ [0,0,0] $\bar{x},x,7/12$ [0,0,0]
6 a .2.1'	$x,0,0$ [0,0,0] $\bar{x},0,1/2$ [0,0,0]	$0,x,2/3$ [0,0,0] $0,\bar{x},1/6$ [0,0,0]	$\bar{x},\bar{x},1/3$ [0,0,0] $x,x,5/6$ [0,0,0]

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $\rho 2mg1'$	Along [210] $\rho 2mg1'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,5/12$

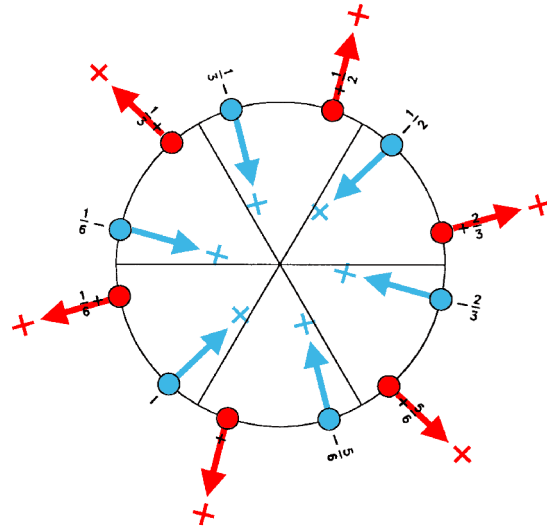
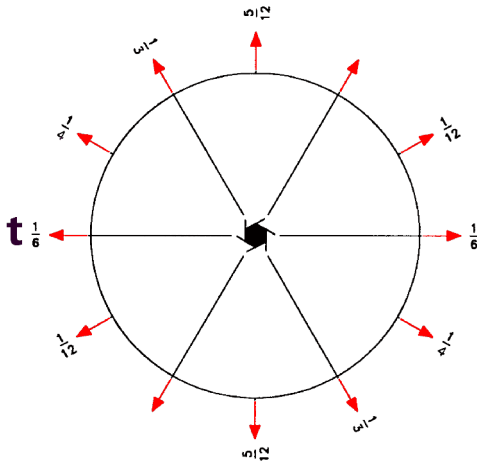
$p6_5 2' 2'$

$62' 2'$

Hexagonal

No. 67.3.339

$p6_5 2' 2'$



Origin on $2'[100]$ at $6_5(2', 1, 1)1$

Asymmetric unit $0 \leq z \leq 1/12$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) $3^+ (0,0,2/3) \ 0,0,z$
(3_z 0,0,2/3) | (3) $3^- (0,0,1/3) \ 0,0,z$
(3_z^{-1} 0,0,1/3) |
| (4) $2 (0,0,1/2) \ 0,0,z$
(2_z 0,0,1/2) | (5) $6^- (0,0,1/6) \ 0,0,z$
(6_z^{-1} 0,0,1/6) | (6) $6^+ (0,0,5/6) \ 0,0,z$
(6_z 0,0,5/6) |
| (7) $2' \ x,x,1/3$
(2_{xy} 0,0,2/3)' | (8) $2' \ x,0,0$
(2_x 0,0,0)' | (9) $2' \ 0,y,1/6$
(2_y 0,0,1/3)' |
| (10) $2' \ x,\bar{x},1/12$
(2_3 0,0,1/6)' | (11) $2' \ x,2x,1/4$
(2_2 0,0,1/2)' | (12) $2' \ 2x,x,5/12$
(2_1 0,0,5/6)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 c 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/6$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+5/6$ [$u-v,u,w$]
	(7) $y,x,\bar{z}+2/3$ [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/3$ [$u,u-v,w$]
	(10) $\bar{y},\bar{x},\bar{z}+1/6$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$u-v,\bar{v},w$]	(12) $x,x-y,\bar{z}+5/6$ [$\bar{u},\bar{u}+v,w$]
6 b ..2'	$x,2x,3/4$ [u,0,w]	$2\bar{x},\bar{x},5/12$ [0,u,w]	$x,\bar{x},1/12$ [\bar{u},\bar{u},w]
	$\bar{x},2\bar{x},1/4$ [$\bar{u},0,w$]	$2x,x,11/12$ [0, \bar{u},w]	$\bar{x},x,7/12$ [u,u,w]
6 a .2'	$x,0,0$ [u,2u,w]	$0,x,2/3$ [2 \bar{u},\bar{u},w]	$\bar{x},\bar{x},1/3$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [$\bar{u},2\bar{u},w$]	$0,\bar{x},1/6$ [2u,u,w]	$x,x,5/6$ [\bar{u},u,w]

Symmetry of special projections

Along [001] 6mm	Along [100] $\rho 2'mg'$ $a^* = c$	Along [210] $\rho 2'mg'$ $a^* = c$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,5/12

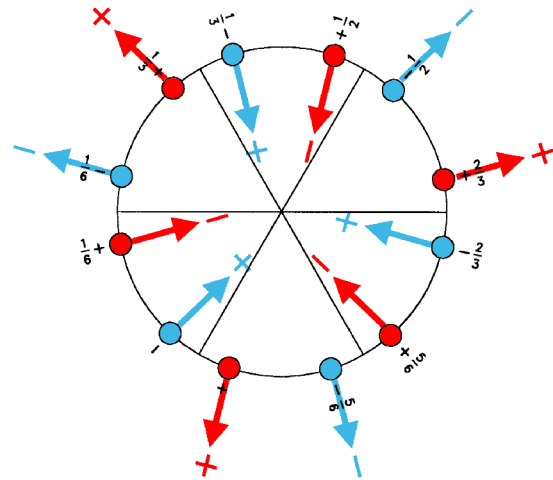
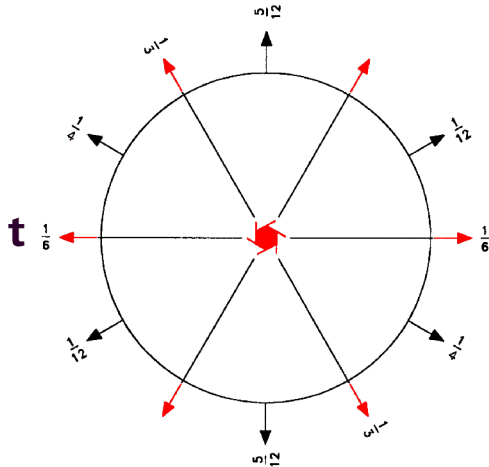
$p6_5'2'2'$

$6'2'2'$

Hexagonal

No. 67.4.340

$p6_5'2'2'$



Origin on $2'[100]$ at $6_5'(2',1,1)1$

Asymmetric unit $0 \leq z \leq 1/12$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ (0,0,2/3) 0,0,z
(3_z 0,0,2/3) | (3) 3^- (0,0,1/3) 0,0,z
(3_z^{-1} 0,0,1/3) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^- (0,0,1/6) 0,0,z
(6_z^{-1} 0,0,1/6)' | (6) 6^+ (0,0,5/6) 0,0,z
(6_z 0,0,5/6)' |
| (7) $2'$ x,x,1/3
(2_{xy} 0,0,2/3)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,1/6
(2_y 0,0,1/3)' |
| (10) 2 x, \bar{x} ,1/12
(2_3 0,0,1/6) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,5/12
(2_1 0,0,5/6) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 c 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z+2/3$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z+1/3$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	(5) $y,\bar{x}+y,z+1/6$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+5/6$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) $y,x,\bar{z}+2/3$ [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/3$ [u,u-v,w]
	(10) $\bar{y},\bar{x},\bar{z}+1/6$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+5/6$ [u,u-v, \bar{w}]
6 b ..2	$x,2x,3/4$ [u,2u,0]	$2\bar{x},\bar{x},5/12$ [$2\bar{u},\bar{u},0$]	$x,\bar{x},1/12$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},1/4$ [u,2u,0]	$2x,x,11/12$ [$2\bar{u},\bar{u},0$]	$\bar{x},x,7/12$ [u, $\bar{u},0$]
6 a .2'	$x,0,0$ [u,2u,w]	$0,x,2/3$ [$2\bar{u},\bar{u},w$]	$\bar{x},\bar{x},1/3$ [u, \bar{u},w]
	$\bar{x},0,1/2$ [u,2u, \bar{w}]	$0,\bar{x},1/6$ [$2\bar{u},\bar{u},\bar{w}$]	$x,x,5/6$ [u, \bar{u},\bar{w}]

Symmetry of special projections

Along [001] $6'mm'$	Along [100] $\rho 2'm'g$	Along [210] $\rho 2mg$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,5/12

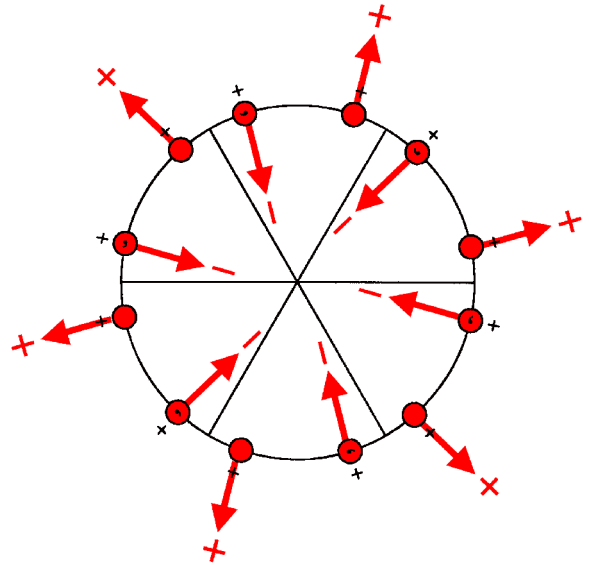
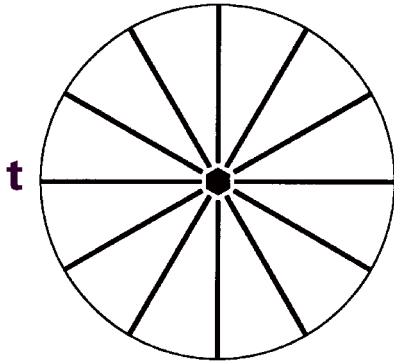
$\rho 6mm$

6mm

Hexagonal

No. 68.1.341

$\rho 6mm$



Origin on 6mm

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) m x, \bar{x}, z
(m_{xy} 0,0,0) | (8) m $x, 2x, z$
(m_x 0,0,0) | (9) m $2x, x, z$
(m_y 0,0,0) |
| (10) m x, x, z
(m_3 0,0,0) | (11) m $x, 0, z$
(m_2 0,0,0) | (12) m $0, y, z$
(m_1 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
12 d 1	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z$ [$u-v,u,w$]
	(7) \bar{y},\bar{x},z [v,u,\bar{w}]	(8) $\bar{x}+y,y,z$ [$u-v,\bar{v},\bar{w}$]	(9) $x,x-y,z$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) y,x,z [\bar{v},\bar{u},\bar{w}]	(11) $x-y,\bar{y},z$ [$\bar{u}+v,v,\bar{w}$]	(12) $\bar{x},\bar{x}+y,z$ [$u,u-v,\bar{w}$]
6 c .m.	x,\bar{x},z [$u,u,0$]	$x,2x,z$ [$\bar{u},0,0$]	$2\bar{x},\bar{x},z$ [$0,\bar{u},0$]
	\bar{x},x,z [$\bar{u},\bar{u},0$]	$\bar{x},2\bar{x},z$ [$u,0,0$]	$2x,x,z$ [$0,u,0$]
6 b ..m	$x,0,z$ [$u,2u,0$]	$0,x,z$ [$2\bar{u},\bar{u},0$]	\bar{x},\bar{x},z [$u,\bar{u},0$]
	$\bar{x},0,z$ [$\bar{u},2\bar{u},0$]	$0,\bar{x},z$ [$2u,u,0$]	x,x,z [$\bar{u},u,0$]
1 a 6mm	$0,0,z$ [$0,0,0$]		

Symmetry of special projections

Along [001] 6mm	Along [100] $\rho 11m1'$	Along [210] $\rho 11m1'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

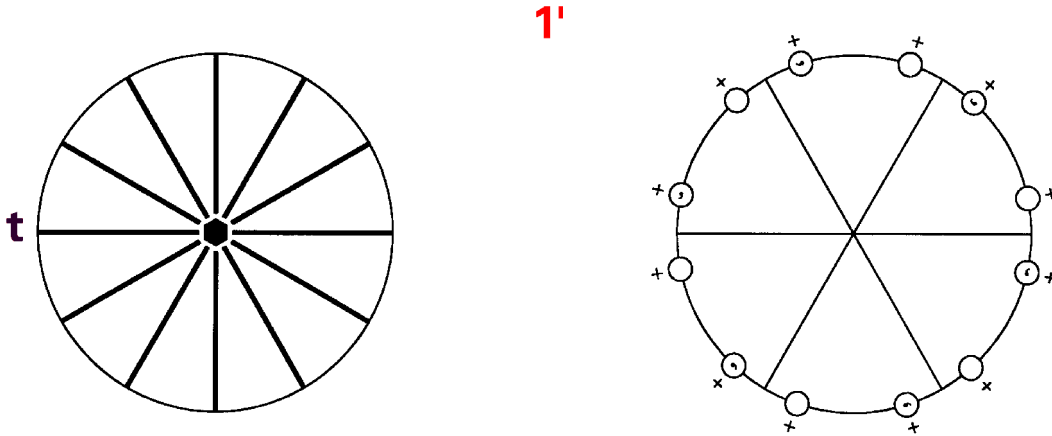
$p6mm1'$

$6mm1'$

Hexagonal

No. 68.2.342

$p6mm1'$



Origin on $6mm1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

For $1 +$ set

- | | | |
|---|---|---|
| (1) 1
($1 0,0,0$) | (2) 3^+ $0,0,z$
($3_z 0,0,0$) | (3) 3^- $0,0,z$
($3_z^{-1} 0,0,0$) |
| (4) 2 $0,0,z$
($2_z 0,0,0$) | (5) 6^- $0,0,z$
($6_z^{-1} 0,0,0$) | (6) 6^+ $0,0,z$
($6_z 0,0,0$) |
| (7) m x,\bar{x},z
($m_{xy} 0,0,0$) | (8) m $x,2x,z$
($m_x 0,0,0$) | (9) m $2x,x,z$
($m_y 0,0,0$) |
| (10) m x,x,z
($m_3 0,0,0$) | (11) m $x,0,z$
($m_2 0,0,0$) | (12) m $0,y,z$
($m_1 0,0,0$) |

For $1' +$ set

- | | | |
|---|---|---|
| (1) $1'$
($1 0,0,0$)' | (2) $3^{+'}$ $0,0,z$
($3_z 0,0,0$)' | (3) $3^{-'}$ $0,0,z$
($3_z^{-1} 0,0,0$)' |
| (4) $2'$ $0,0,z$
($2_z 0,0,0$)' | (5) $6^{-'}$ $0,0,z$
($6_z^{-1} 0,0,0$)' | (6) $6^{+'}$ $0,0,z$
($6_z 0,0,0$)' |
| (7) m' x,\bar{x},z
($m_{xy} 0,0,0$)' | (8) m' $x,2x,z$
($m_x 0,0,0$)' | (9) m' $2x,x,z$
($m_y 0,0,0$)' |
| (10) m' x,x,z
($m_3 0,0,0$)' | (11) m' $x,0,z$
($m_2 0,0,0$)' | (12) m' $0,y,z$
($m_1 0,0,0$)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

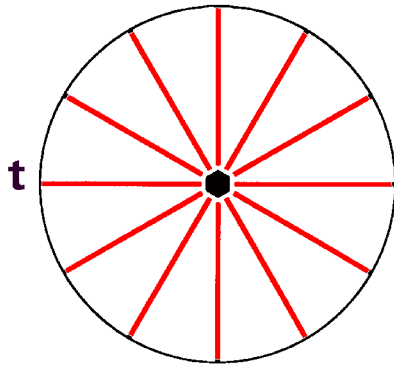
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1'+$	
12 d $11'$	(1) x,y,z [0,0,0] (4) \bar{x},\bar{y},z [0,0,0] (7) \bar{y},\bar{x},z [0,0,0] (10) y,x,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0] (5) $y,\bar{x}+y,z$ [0,0,0] (8) $\bar{x}+y,y,z$ [0,0,0] (11) $x-y,\bar{y},z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0] (6) $x-y,x,z$ [0,0,0] (9) $x,x-y,z$ [0,0,0] (12) $\bar{x},\bar{x}+y,z$ [0,0,0]
6 c $.m.1'$	x,\bar{x},z [0,0,0] \bar{x},x,z [0,0,0]	$x,2x,z$ [0,0,0] $\bar{x},2\bar{x},z$ [0,0,0]	$2\bar{x},\bar{x},z$ [0,0,0] $2x,x,z$ [0,0,0]
6 b $..m1'$	$x,0,z$ [0,0,0] $\bar{x},0,z$ [0,0,0]	$0,x,z$ [0,0,0] $0,\bar{x},z$ [0,0,0]	\bar{x},\bar{x},z [0,0,0] x,x,z [0,0,0]
1 a $6mm1'$	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $p11m1'$	Along [210] $p11m1'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

$\rho 6m'm'$

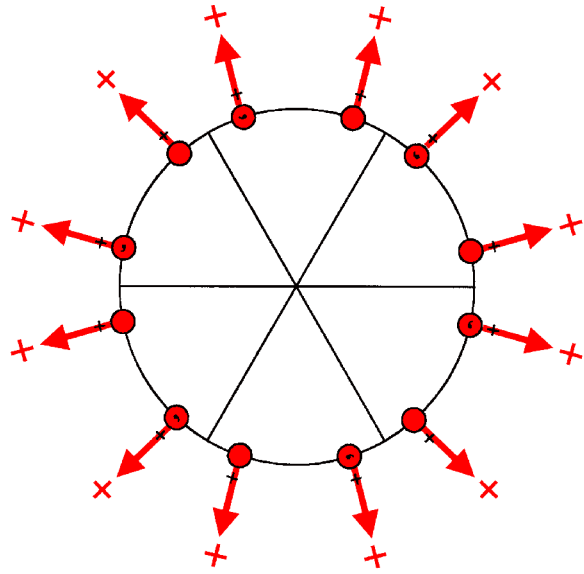
No. 68.3.343



$6m'm'$

$\rho 6m'm'$

Hexagonal



Origin on $6m'm'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (8) m' x,2x,z
(m_x 0,0,0)' | (9) m' 2x,x,z
(m_y 0,0,0)' |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' x,0,z
(m_2 0,0,0)' | (12) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

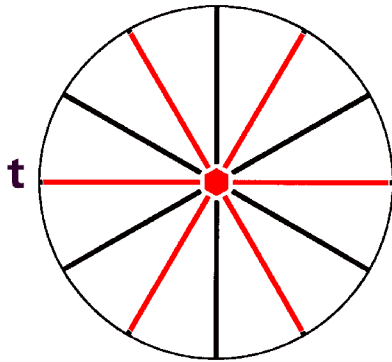
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z [v,\bar{u}+v,w]$	(6) $x-y,x,z [u-v,u,w]$
	(7) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(8) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(9) $x,x-y,z [u,u-v,w]$
	(10) $y,x,z [v,u,w]$	(11) $x-y,\bar{y},z [u-v,\bar{v},w]$	(12) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$
6 c \bar{m}'	$x,\bar{x},z [u,\bar{u},w]$	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$
	$\bar{x},x,z [\bar{u},u,w]$	$\bar{x},2\bar{x},z [\bar{u},2\bar{u},w]$	$2x,x,z [2u,u,w]$
6 b \bar{m}'	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
	$\bar{x},0,z [\bar{u},0,w]$	$0,\bar{x},z [0,\bar{u},w]$	$x,x,z [u,u,w]$
1 a $6m'm'$	$0,0,z [0,0,w]$		

Symmetry of special projections

Along [001] $6m'm'$	Along [100] $\rho 11m'$	Along [210] $\rho 11m'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

$p6'mm'$

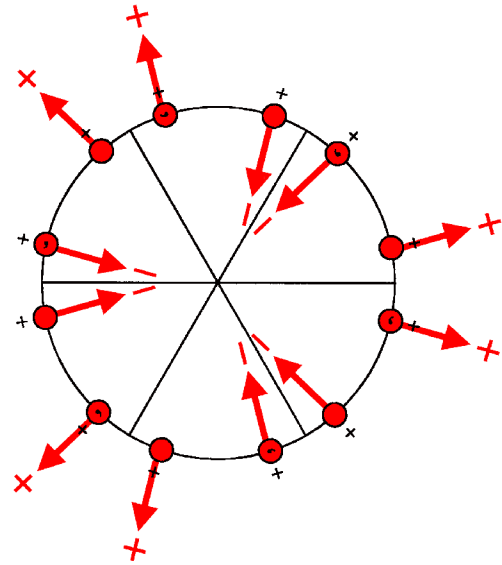
No. 68.4.344



$6'mm'$

$p6'mm'$

Hexagonal



Origin on $6'mm'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (8) m x,2x,z
(m_x 0,0,0) | (9) m 2x,x,z
(m_y 0,0,0) |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' x,0,z
(m_2 0,0,0)' | (12) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 d 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v,\bar{w}]	(5) $y,\bar{x}+y,z$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) \bar{y},\bar{x},z [v,u,\bar{w}]	(8) $\bar{x}+y,y,z$ [$u-v,\bar{v},\bar{w}$]	(9) $x,x-y,z$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) y,x,z [v,u,w]	(11) $x-y,\bar{y},z$ [$u-v,\bar{v},w$]	(12) $\bar{x},\bar{x}+y,z$ [$\bar{u},\bar{u}+v,w$]
6 c .m.	x,\bar{x},z [$u,u,0$]	$x,2x,z$ [$\bar{u},0,0$]	$2\bar{x},\bar{x},z$ [$0,\bar{u},0$]
	\bar{x},x,z [$u,u,0$]	$\bar{x},2\bar{x},z$ [$\bar{u},0,0$]	$2x,x,z$ [$0,\bar{u},0$]
6 b ..m'	$x,0,z$ [$u,0,w$]	$0,x,z$ [$0,u,w$]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]
	$\bar{x},0,z$ [$u,0,\bar{w}$]	$0,\bar{x},z$ [$0,u,\bar{w}$]	x,x,z [\bar{u},\bar{u},\bar{w}]
1 a 6'mm'	$0,0,z$ [$0,0,0$]		

Symmetry of special projections

Along [001] $6'mm'$	Along [100] $p11m1'$	Along [210] $p11m$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

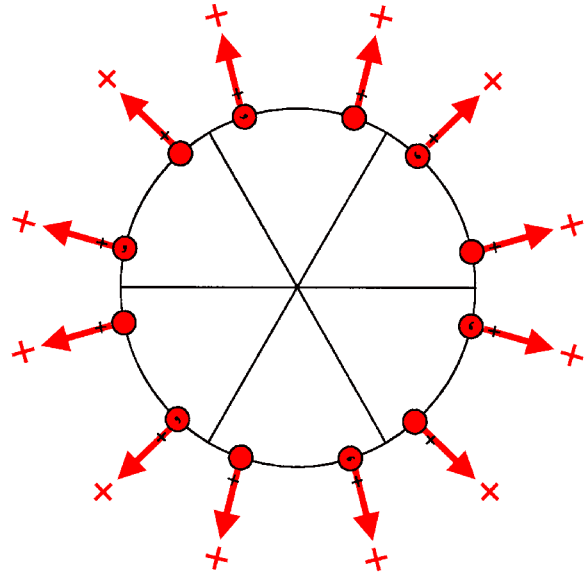
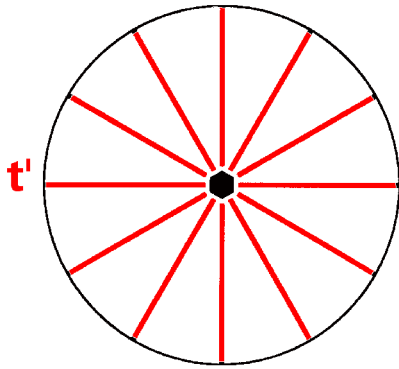
$\rho_{2c} 6m'm'$

$6mm1'$

Hexagonal

No. 68.5.345

$\rho_{2c} 6m'm'$



Origin on $6m'm'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

For $(0,0,0) +$ set

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (8) m' x,2x,z
(m_x 0,0,0)' | (9) m' 2x,x,z
(m_y 0,0,0)' |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' x,0,z
(m_2 0,0,0)' | (12) m' 0,y,z
(m_1 0,0,0)' |

For $(0,0,1) +$ set

- | | | |
|--|---|---|
| (1) t' (0,0,1)
(1 0,0,1)' | (2) 3^{+-} (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) 3^{-+} (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) $2'$ (0,0,1) 0,0,z
(2_z 0,0,1)' | (5) 6^{-+} (0,0,1) 0,0,z
(6_z^{-1} 0,0,1)' | (6) 6^{+-} (0,0,1) 0,0,z
(6_z 0,0,1)' |
| (7) c (0,0,1) x, \bar{x} ,z
(m_{xy} 0,0,1)' | (8) c (0,0,1) x,2x,z
(m_x 0,0,1)' | (9) c (0,0,1) 2x,x,z
(m_y 0,0,1)' |
| (10) c (0,0,1) x,x,z
(m_3 0,0,1)' | (11) c (0,0,1) x,0,z
(m_2 0,0,1)' | (12) c (0,0,1) 0,y,z
(m_1 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
12 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z [v,\bar{u}+v,w]$	(6) $x-y,x,z [u-v,u,w]$
	(7) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(8) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(9) $x,x-y,z [u,u-v,w]$
	(10) $y,x,z [v,u,w]$	(11) $x-y,\bar{y},z [u-v,\bar{v},w]$	(12) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$
6 c $..m'$	$x,\bar{x},z [u,\bar{u},w]$	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$
	$\bar{x},x,z [\bar{u},u,w]$	$\bar{x},2\bar{x},z [\bar{u},2\bar{u},w]$	$2x,x,z [2u,u,w]$
6 b $..m'$	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
	$\bar{x},0,z [\bar{u},0,w]$	$0,\bar{x},z [0,\bar{u},w]$	$x,x,z [u,u,w]$
1 a $6m'm'$	$0,0,z [0,0,w]$		

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $\rho_{2a^*} 11m'$	Along [210] $\rho_{2a^*} 11m'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

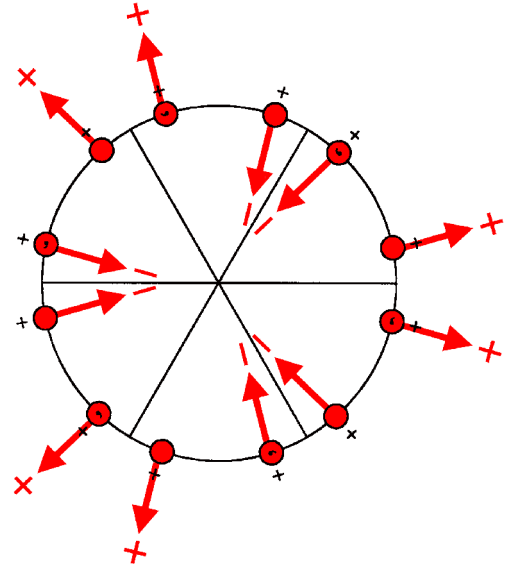
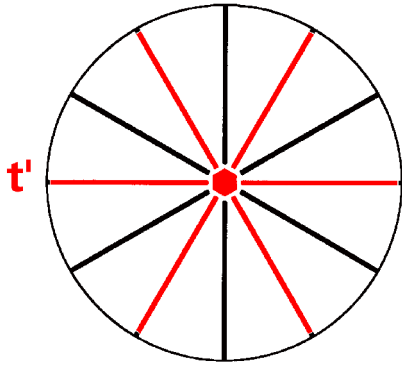
$\rho_{2c} 6'mm'$

$6mm1'$

Hexagonal

No. 68.6.346

$\rho_{2c} 6'mm'$



Origin on $6'mm'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) m x, \bar{x}, z
(m_{xy} 0,0,0) | (8) m $x, 2x, z$
(m_x 0,0,0) | (9) m $2x, x, z$
(m_y 0,0,0) |
| (10) m' x, x, z
(m_3 0,0,0)' | (11) m' $x, 0, z$
(m_2 0,0,0)' | (12) m' $0, y, z$
(m_1 0,0,0)' |
| For (0,0,1)' + set | | |
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) 2 (0,0,1) 0,0,z
(2_z 0,0,1) | (5) 6^- (0,0,1) 0,0,z
(6_z^{-1} 0,0,1) | (6) 6^+ (0,0,1) 0,0,z
(6_z 0,0,1) |
| (7) c' (0,0,1) x, \bar{x}, z
(m_{xy} 0,0,1)' | (8) c' (0,0,1) $x, 2x, z$
(m_x 0,0,1)' | (9) c' (0,0,1) $2x, x, z$
(m_y 0,0,1)' |
| (10) c (0,0,1) x, x, z
(m_3 0,0,1) | (11) c (0,0,1) $x, 0, z$
(m_2 0,0,1) | (12) c (0,0,1) $0, y, z$
(m_1 0,0,1) |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
12 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z [\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(8) $\bar{x}+y,y,z [u-v,\bar{v},\bar{w}]$	(9) $x,x-y,z [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $y,x,z [v,u,w]$	(11) $x-y,\bar{y},z [u-v,\bar{v},w]$	(12) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$
6 c .m.	$x,\bar{x},z [u,u,0]$	$x,2x,z [\bar{u},0,0]$	$2\bar{x},\bar{x},z [0,\bar{u},0]$
	$\bar{x},x,z [u,u,0]$	$\bar{x},2\bar{x},z [\bar{u},0,0]$	$2x,x,z [0,\bar{u},0]$
6 b ..m'	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
	$\bar{x},0,z [u,0,\bar{w}]$	$0,\bar{x},z [0,u,\bar{w}]$	$x,x,z [\bar{u},\bar{u},\bar{w}]$
1 a 6'mm'	$0,0,z [0,0,0]$		

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $p11m1'$	Along [210] $p_{2a^*} 11m$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,0$

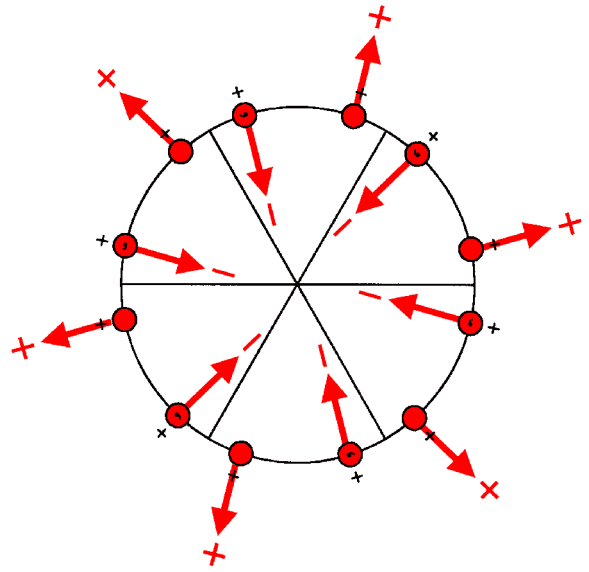
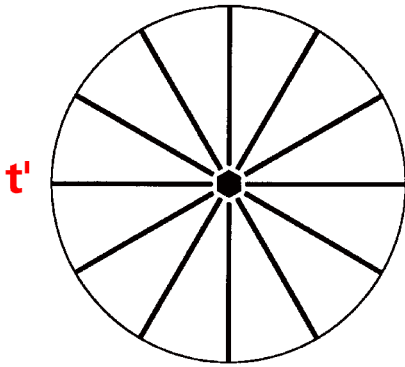
$\rho_{2c} 6mm$

$6mm1'$

Hexagonal

No. 68.7.347

$\rho_{2c} 6mm$



Origin on $6mm$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) m x, \bar{x}, z
(m_{xy} 0,0,0) | (8) m $x, 2x, z$
(m_x 0,0,0) | (9) m $2x, x, z$
(m_y 0,0,0) |
| (10) m x, x, z
(m_3 0,0,0) | (11) m $x, 0, z$
(m_2 0,0,0) | (12) m $0, y, z$
(m_1 0,0,0) |
| For (0,0,1)' + set | | |
| (1) t' (0,0,1)
(1 0,0,1)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) 2' (0,0,1) 0,0,z
(2_z 0,0,1)' | (5) $6^{-'}$ (0,0,1) 0,0,z
(6_z^{-1} 0,0,1)' | (6) $6^{+'}$ (0,0,1) 0,0,z
(6_z 0,0,1)' |
| (7) c' (0,0,1) x, \bar{x}, z
(m_{xy} 0,0,1)' | (8) c' (0,0,1) $x, 2x, z$
(m_x 0,0,1)' | (9) c' (0,0,1) $2x, x, z$
(m_y 0,0,1)' |
| (10) c' (0,0,1) x, x, z
(m_3 0,0,1)' | (11) c' (0,0,1) $x, 0, z$
(m_2 0,0,1)' | (12) c' (0,0,1) $0, y, z$
(m_1 0,0,1)' |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(0,0,0)+	(0,0,1)' +	
12 d 1	(1) $x,y,z [u,v,w]$ (4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$ (7) $\bar{y},\bar{x},z [v,u,\bar{w}]$ (10) $y,x,z [\bar{v},\bar{u},\bar{w}]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$ (5) $y,\bar{x}+y,z [v,\bar{u}+v,w]$ (8) $\bar{x}+y,y,z [u-v,\bar{v},\bar{w}]$ (11) $x-y,\bar{y},z [\bar{u}+v,v,\bar{w}]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$ (6) $x-y,x,z [u-v,u,w]$ (9) $x,x-y,z [\bar{u},\bar{u}+v,\bar{w}]$ (12) $\bar{x},\bar{x}+y,z [u,u-v,\bar{w}]$
6 c .m.	$x,\bar{x},z [u,u,0]$ $\bar{x},x,z [\bar{u},\bar{u},0]$	$x,2x,z [\bar{u},0,0]$ $\bar{x},2\bar{x},z [u,0,0]$	$2\bar{x},\bar{x},z [0,\bar{u},0]$ $2x,x,z [0,u,0]$
6 b ..m	$x,0,z [u,2u,0]$ $\bar{x},0,z [\bar{u},2\bar{u},0]$	$0,x,z [2\bar{u},\bar{u},0]$ $0,\bar{x},z [2u,u,0]$	$\bar{x},\bar{x},z [u,\bar{u},0]$ $x,x,z [\bar{u},u,0]$
1 a 6mm	$0,0,z [0,0,0]$		

Symmetry of special projections

Along [001] 6mm1'	Along [100] $p11m1'$ $a^* = c$	Along [210] $p11m1'$ $a^* = c$
Origin at 0,0,z	Origin at $x,0,0$	Origin at $x,x/2,0$

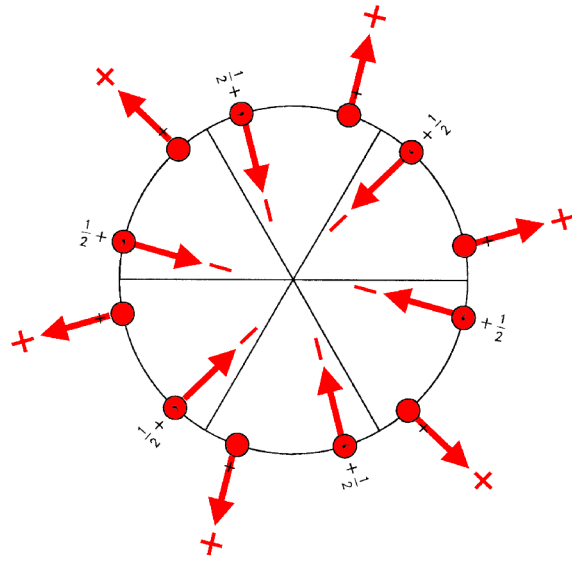
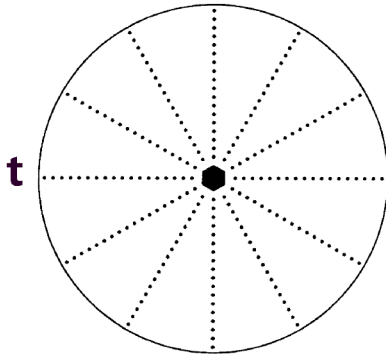
$p6cc$

$6mm$

Hexagonal

No. 69.1.348

$p6cc$



Origin on $6cc$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) c (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2) | (8) c (0,0,1/2) x,2x,z
(m_x 0,0,1/2) | (9) c (0,0,1/2) 2x,x,z
(m_y 0,0,1/2) |
| (10) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (11) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (12) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
12 b 1	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) x-y,x,z [u-v,u,w]
	(7) $\bar{y},\bar{x},z+1/2$ [v,u,\bar{w}]	(8) $\bar{x}+y,y,z+1/2$ [$u-v,\bar{v},\bar{w}$]	(9) x,x-y,z+1/2 [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) x-y, $\bar{y},z+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $\bar{x},\bar{x}+y,z+1/2$ [$u,u-v,\bar{w}$]
2 a 6..	0,0,z [0,0,w]	0,0,z+1/2 [0,0, \bar{w}]	

Symmetry of special projections

Along [001] 6mm	Along [100] p_{2a^*} 11m'	Along [210] p_{2a^*} 11m'
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

$p6cc1'$

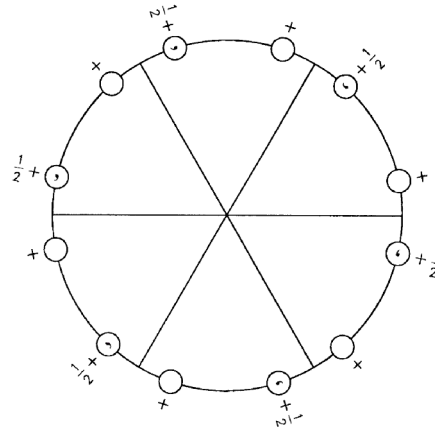
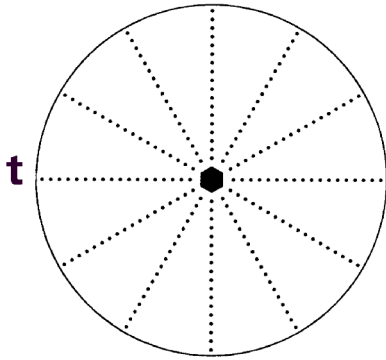
$6mm1'$

Hexagonal

No. 69.2.349

$p6cc1'$

1'



Origin on $6cc1'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x$

Symmetry operations

For $1 +$ set

- | | | |
|---|---|---|
| (1) 1
($1 0,0,0$) | (2) 3^+ $0,0,z$
($3_z 0,0,0$) | (3) 3^- $0,0,z$
($3_z^{-1} 0,0,0$) |
| (4) 2 $0,0,z$
($2_z 0,0,0$) | (5) 6^- $0,0,z$
($6_z^{-1} 0,0,0$) | (6) 6^+ $0,0,z$
($6_z 0,0,0$) |
| (7) c $(0,0,1/2)$ x,\bar{x},z
($m_{xy} 0,0,1/2$) | (8) c $(0,0,1/2)$ $x,2x,z$
($m_x 0,0,1/2$) | (9) c $(0,0,1/2)$ $2x,x,z$
($m_y 0,0,1/2$) |
| (10) c $(0,0,1/2)$ x,x,z
($m_3 0,0,1/2$) | (11) c $(0,0,1/2)$ $x,0,z$
($m_2 0,0,1/2$) | (12) c $(0,0,1/2)$ $0,y,z$
($m_1 0,0,1/2$) |

For $1' +$ set

- | | | |
|---|---|---|
| (1) $1'$
($1 0,0,0$)' | (2) $3^{+'}$ $0,0,z$
($3_z 0,0,0$)' | (3) $3^{-'}$ $0,0,z$
($3_z^{-1} 0,0,0$)' |
| (4) $2'$ $0,0,z$
($2_z 0,0,0$)' | (5) $6^{-'}$ $0,0,z$
($6_z^{-1} 0,0,0$)' | (6) $6^{+'}$ $0,0,z$
($6_z 0,0,0$)' |
| (7) c' $(0,0,1/2)$ x,\bar{x},z
($m_{xy} 0,0,1/2$)' | (8) c' $(0,0,1/2)$ $x,2x,z$
($m_x 0,0,1/2$)' | (9) c' $(0,0,1/2)$ $2x,x,z$
($m_y 0,0,1/2$)' |
| (10) c' $(0,0,1/2)$ x,x,z
($m_3 0,0,1/2$)' | (11) c' $(0,0,1/2)$ $x,0,z$
($m_2 0,0,1/2$)' | (12) c' $(0,0,1/2)$ $0,y,z$
($m_1 0,0,1/2$)' |

Generators selected (1); t(0,0,1); (2); (4); (7); 1'

Positions

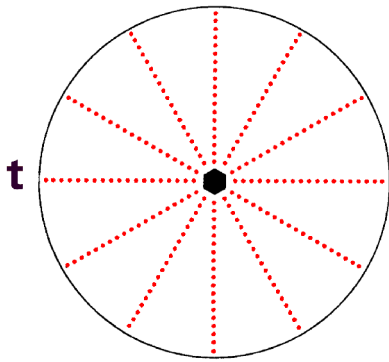
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
12 b 11'	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) \bar{x},\bar{y},z [0,0,0]	(5) $y,\bar{x}+y,z$ [0,0,0]	(6) x-y,x,z [0,0,0]
	(7) $\bar{y},\bar{x},z+1/2$ [0,0,0]	(8) $\bar{x}+y,y,z+1/2$ [0,0,0]	(9) x,x-y,z+1/2 [0,0,0]
	(10) y,x,z+1/2 [0,0,0]	(11) x-y, $\bar{y},z+1/2$ [0,0,0]	(12) $\bar{x},\bar{x}+y,z+1/2$ [0,0,0]
2 a 6..1'	0,0,z [0,0,0]	0,0,z+1/2 [0,0,0]	

Symmetry of special projections

Along [001] 6mm1'	Along [100] p11m1' a* = c/2	Along [210] p11m1' a* = c/2
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

$p6c'c'$

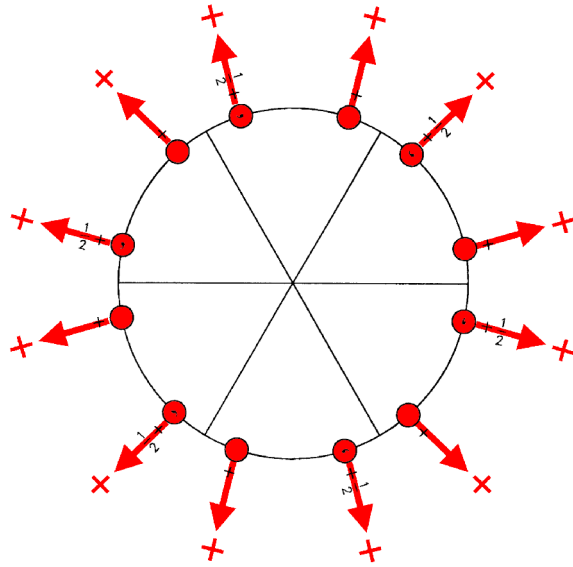
No. 69.3.350



$6m'm'$

$p6c'c'$

Hexagonal



Origin on $6c'c'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) c' (0,0,1/2) x, \bar{x}, z
(m_{xy} 0,0,1/2)' | (8) c' (0,0,1/2) $x, 2x, z$
(m_x 0,0,1/2)' | (9) c' (0,0,1/2) $2x, x, z$
(m_y 0,0,1/2)' |
| (10) c' (0,0,1/2) x, x, z
(m_3 0,0,1/2)' | (11) c' (0,0,1/2) $x, 0, z$
(m_2 0,0,1/2)' | (12) c' (0,0,1/2) $0, y, z$
(m_1 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
12 b 1	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) x-y,x,z [u-v,u,w]
	(7) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{x}+y,y,z+1/2$ [$\bar{u}+v,v,w$]	(9) x,x-y,z+1/2 [u,u-v,w]
	(10) y,x,z+1/2 [v,u,w]	(11) x-y, $\bar{y},z+1/2$ [u-v, \bar{v},w]	(12) $\bar{x},\bar{x}+y,z+1/2$ [$\bar{u},\bar{u}+v,w$]
	2 a 6..	0,0,z [0,0,w]	0,0,z+1/2 [0,0,w]

Symmetry of special projections

Along [001] 6m'm'	Along [100] p11m' a* = c/2	Along [210] p11m' a* = c/2
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

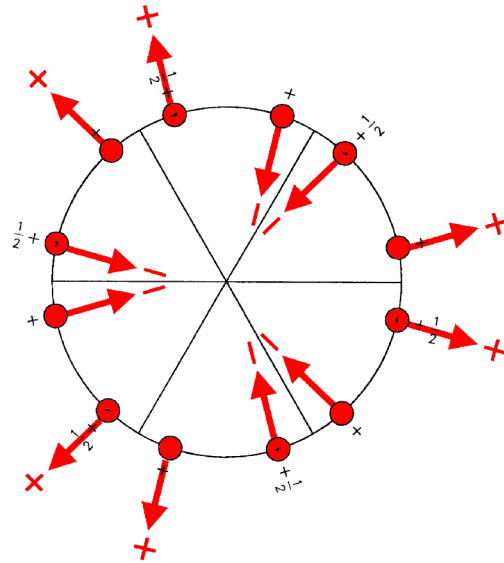
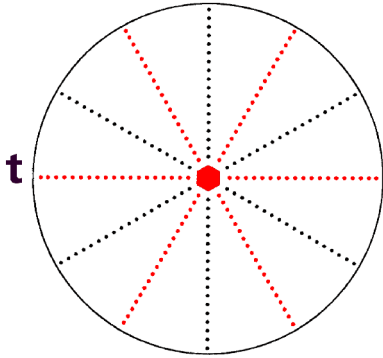
$p6'cc'$

No. 69.4.351

$6'mm'$

$p6'cc'$

Hexagonal



Origin on $6'cc'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) c (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2) | (8) c (0,0,1/2) x,2x,z
(m_x 0,0,1/2) | (9) c (0,0,1/2) 2x,x,z
(m_y 0,0,1/2) |
| (10) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (11) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (12) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
12 b 1	(4) \bar{x},\bar{y},z [u,v,\bar{w}]	(5) $y,\bar{x}+y,z$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) $\bar{y},\bar{x},z+1/2$ [v,u,\bar{w}]	(8) $\bar{x}+y,y,z+1/2$ [$u-v,\bar{v},\bar{w}$]	(9) $x,x-y,z+1/2$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $y,x,z+1/2$ [v,u,w]	(11) $x-y,\bar{y},z+1/2$ [$u-v,\bar{v},w$]	(12) $\bar{x},\bar{x}+y,z+1/2$ [$\bar{u},\bar{u}+v,w$]
	2 a 6'..	$0,0,z$ [$0,0,0$]	$0,0,z+1/2$ [$0,0,0$]

Symmetry of special projections

Along [001] $6'mm'$	Along [100] $\rho_{2a^*} 11m$ $a^* = c/2$	Along [210] $\rho 11m$ $a^* = c/2$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

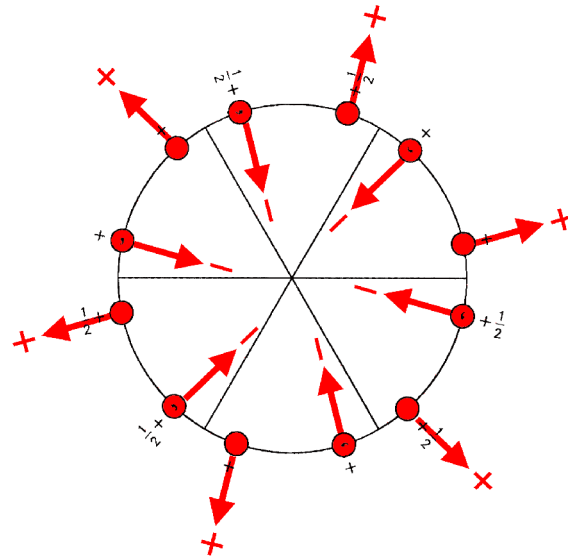
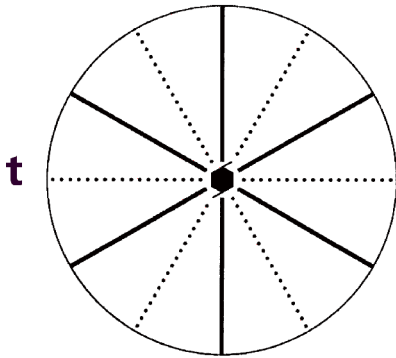
$\rho 6_3 mc$

6mm

Hexagonal

No. 70.1.352

$\rho 6_3 mc$



Origin on 3m1 on $6_3 mc$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1$; $y \leq x/2$

Symmetry operations

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) m x, \bar{x}, z
(m_{xy} 0,0,0) | (8) m $x, 2x, z$
(m_x 0,0,0) | (9) m $2x, x, z$
(m_y 0,0,0) |
| (10) c (0,0,1/2) x, x, z
(m_3 0,0,1/2) | (11) c (0,0,1/2) $x, 0, z$
(m_2 0,0,1/2) | (12) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z+1/2 [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z+1/2 [v,\bar{u}+v,w]$	(6) $x-y,x,z+1/2 [u-v,u,w]$
	(7) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(8) $\bar{x}+y,y,z [u-v,\bar{v},\bar{w}]$	(9) $x,x-y,z [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $y,x,z+1/2 [\bar{v},\bar{u},\bar{w}]$	(11) $x-y,\bar{y},z+1/2 [\bar{u}+v,v,\bar{w}]$	(12) $\bar{x},\bar{x}+y,z+1/2 [u,u-v,\bar{w}]$
6 b .m.	$x,\bar{x},z [u,u,0]$	$x,2x,z [\bar{u},0,0]$	$2\bar{x},\bar{x},z [0,\bar{u},0]$
	$\bar{x},x,z+1/2 [\bar{u},\bar{u},0]$	$\bar{x},2\bar{x},z+1/2 [u,0,0]$	$2x,x,z+1/2 [0,u,0]$
2 a 3m.	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$	

Symmetry of special projections

Along [001] $6mm$	Along [100] $\rho 11g1'$ $a^* = c$	Along [210] $\rho_{2a^*} 11m$ $a^* = c/2$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

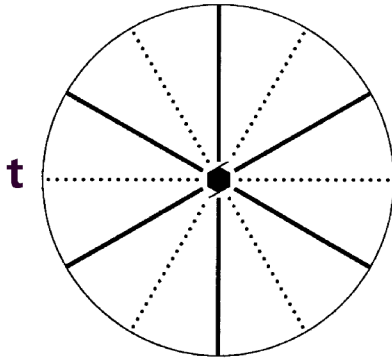
$p6_3mc1'$

$6mm1'$

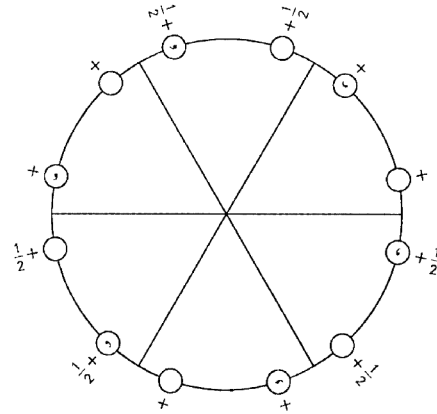
Hexagonal

No. 70.2.353

$p6_3mc1'$



1'



Origin on $3m11'$ on $6_3mc1'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

For 1 + set

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) m x, \bar{x}, z
(m_{xy} 0,0,0) | (8) m $x, 2x, z$
(m_x 0,0,0) | (9) m $2x, x, z$
(m_y 0,0,0) |
| (10) c (0,0,1/2) x, x, z
(m_3 0,0,1/2) | (11) c (0,0,1/2) $x, 0, z$
(m_2 0,0,1/2) | (12) c (0,0,1/2) $0, y, z$
(m_1 0,0,1/2) |

For 1' + set

- | | | |
|---|---|--|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) 2' (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) $6^{-'}$ (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) $6^{+'}$ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) m' x, \bar{x}, z
(m_{xy} 0,0,0)' | (8) m' $x, 2x, z$
(m_x 0,0,0)' | (9) m' $2x, x, z$
(m_y 0,0,0)' |
| (10) c' (0,0,1/2) x, x, z
(m_3 0,0,1/2)' | (11) c' (0,0,1/2) $x, 0, z$
(m_2 0,0,1/2)' | (12) c' (0,0,1/2) $0, y, z$
(m_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

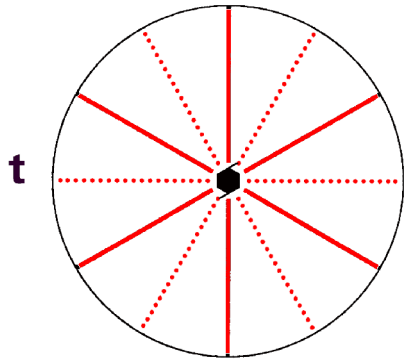
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1'+$	
12 c $11'$	(1) $x,y,z [0,0,0]$ (4) $\bar{x},\bar{y},z+1/2 [0,0,0]$ (7) $\bar{y},\bar{x},z [0,0,0]$ (10) $y,x,z+1/2 [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$ (5) $y,\bar{x}+y,z+1/2 [0,0,0]$ (8) $\bar{x}+y,y,z [0,0,0]$ (11) $x-y,\bar{y},z+1/2 [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$ (6) $x-y,x,z+1/2 [0,0,0]$ (9) $x,x-y,z [0,0,0]$ (12) $\bar{x},\bar{x}+y,z+1/2 [0,0,0]$
6 b $.m.1'$	$x,\bar{x},z [0,0,0]$ $\bar{x},x,z+1/2 [0,0,0]$	$x,2x,z [0,0,0]$ $\bar{x},2\bar{x},z+1/2 [0,0,0]$	$2\bar{x},\bar{x},z [0,0,0]$ $2x,x,z+1/2 [0,0,0]$
2 a $3m.1'$	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$	

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $\rho 11g1'$ $a^* = c$	Along [210] $\rho 11m1'$ $a^* = c/2$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x/2,0$

$\rho 6_3 m' c'$

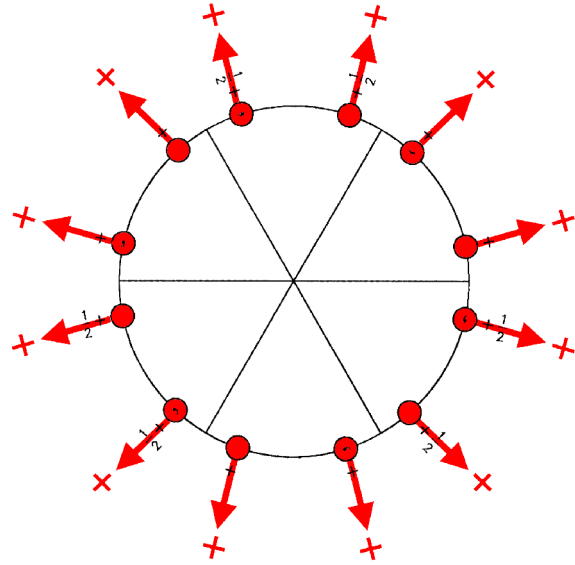
No. 70.3.354



$6m'm'$

$\rho 6_3 m' c'$

Hexagonal



Origin on $3m'1$ on $6_3 m' c'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (8) m' x,2x,z
(m_x 0,0,0)' | (9) m' 2x,x,z
(m_y 0,0,0)' |
| (10) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (11) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (12) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z+1/2 [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z+1/2 [v,\bar{u}+v,w]$	(6) $x-y,x,z+1/2 [u-v,u,w]$
	(7) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(8) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(9) $x,x-y,z [u,u-v,w]$
	(10) $y,x,z+1/2 [v,u,w]$	(11) $x-y,\bar{y},z+1/2 [u-v,\bar{v},w]$	(12) $\bar{x},\bar{x}+y,z+1/2 [\bar{u},\bar{u}+v,w]$
6 b .m'	$x,\bar{x},z [u,\bar{u},w]$	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$
	$\bar{x},x,z+1/2 [\bar{u},u,w]$	$\bar{x},2\bar{x},z+1/2 [\bar{u},2\bar{u},w]$	$2x,x,z+1/2 [2u,u,w]$
2 a 3m'	$0,0,z [0,0,w]$	$0,0,z+1/2 [0,0,w]$	

Symmetry of special projections

Along [001] $6m'm'$	Along [100] $\rho 11g'$	Along [210] $\rho 11m'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

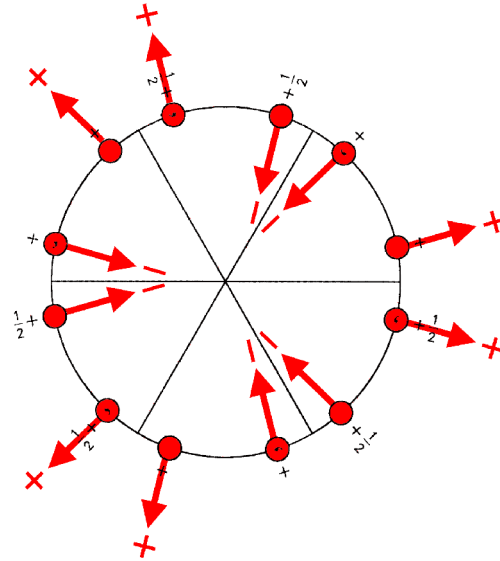
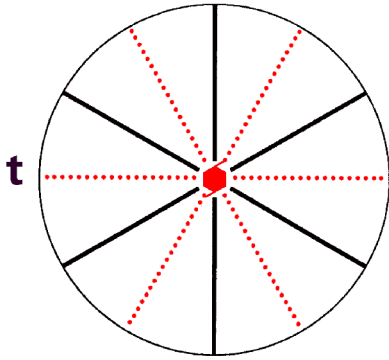
$\rho 6_3 'mc'$

No. 70.4.355

$6' mm'$

$\rho 6_3 'mc'$

Hexagonal



Origin on $3m1$ on $6_3 'mc'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) m x, \bar{x}, z
(m_{xy} 0,0,0) | (8) m $x, 2x, z$
(m_x 0,0,0) | (9) m $2x, x, z$
(m_y 0,0,0) |
| (10) c' (0,0,1/2) x, x, z
(m_3 0,0,1/2)' | (11) c' (0,0,1/2) $x, 0, z$
(m_2 0,0,1/2)' | (12) c' (0,0,1/2) $0, y, z$
(m_1 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 c 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [\bar{v} ,u-v,w]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}$,w]
	(4) $\bar{x}, \bar{y}, z+1/2$ [u,v, \bar{w}]	(5) $y, \bar{x}+y, z+1/2$ [\bar{v} ,u-v, \bar{w}]	(6) $x-y, x, z+1/2$ [$\bar{u}+v, \bar{u}$, \bar{w}]
	(7) \bar{y}, \bar{x}, z [v,u, \bar{w}]	(8) $\bar{x}+y, y, z$ [u-v, \bar{v} , \bar{w}]	(9) $x, x-y, z$ [$\bar{u}, \bar{u}+v, \bar{w}$]
	(10) $y, x, z+1/2$ [v,u,w]	(11) $x-y, \bar{y}, z+1/2$ [u-v, \bar{v} ,w]	(12) $\bar{x}, \bar{x}+y, z+1/2$ [$\bar{u}, \bar{u}+v, w$]
6 b .m.	x, \bar{x}, z [u,u,0]	$x, 2x, z$ [\bar{u} ,0,0]	$2\bar{x}, \bar{x}, z$ [0, \bar{u} ,0]
	$\bar{x}, x, z+1/2$ [u,u,0]	$\bar{x}, 2\bar{x}, z+1/2$ [\bar{u} ,0,0]	$2x, x, z+1/2$ [0, \bar{u} ,0]
2 a 3m.	$0, 0, z$ [0,0,0]	$0, 0, z+1/2$ [0,0,0]	

Symmetry of special projections

Along [001] $6'mm'$	Along [100] $\rho 11g1'$	Along [210] $\rho 11m$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

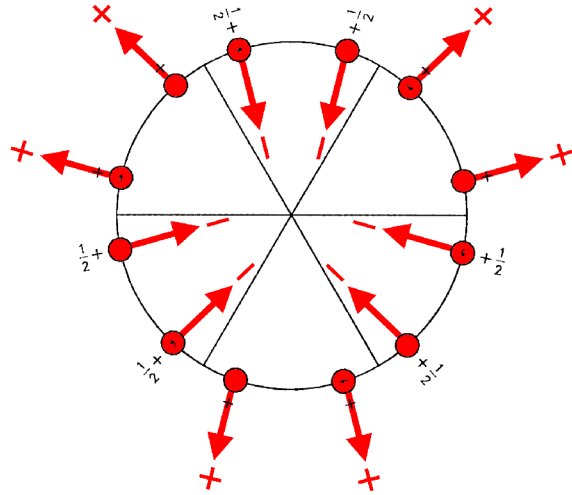
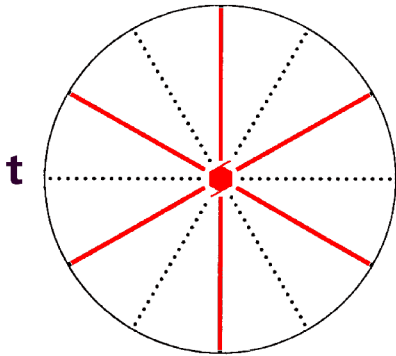
$p6_3'm'c$

No. 70.5.356

$6'm'm$

$p6_3'm'c$

Hexagonal



Origin on $3m'1$ on $6_3'm'c$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (8) m' x,2x,z
(m_x 0,0,0)' | (9) m' 2x,x,z
(m_y 0,0,0)' |
| (10) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (11) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (12) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z+1/2 [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z+1/2 [\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z+1/2 [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(8) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(9) $x,x-y,z [u,u-v,w]$
	(10) $y,x,z+1/2 [\bar{v},\bar{u},\bar{w}]$	(11) $x-y,\bar{y},z+1/2 [\bar{u}+v,v,\bar{w}]$	(12) $\bar{x},\bar{x}+y,z+1/2 [u,u-v,\bar{w}]$
6 b .m'	$x,\bar{x},z [u,\bar{u},w]$	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$
	$\bar{x},x,z+1/2 [u,\bar{u},\bar{w}]$	$\bar{x},2\bar{x},z+1/2 [u,2u,\bar{w}]$	$2x,x,z+1/2 [2\bar{u},\bar{u},\bar{w}]$
2 a 3m'	$0,0,z [0,0,w]$	$0,0,z+1/2 [0,0,\bar{w}]$	

Symmetry of special projections

Along [001] $6'm'm$	Along [100] $\rho 11g$	Along [210] $\rho_{2a^*} 11m'$
Origin at 0,0,z	$a^* = c$ Origin at $x,0,0$	$a^* = c/2$ Origin at $x,x/2,0$

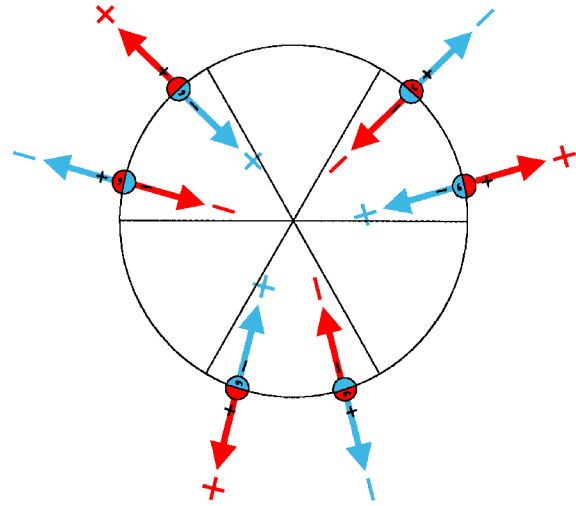
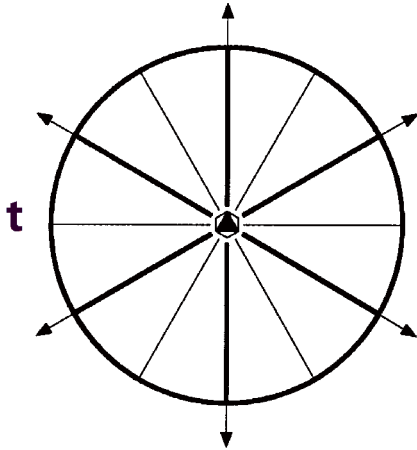
$\rho\bar{6}m2$

No. 71.1.357

$\bar{6}m2$

$\rho\bar{6}m2$

Hexagonal



Origin on $\bar{6}m2$

Asymmetric unit $y \leq x/2; y \geq -x; 0 \leq z \leq 1/2$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (7) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (8) m x,2x,z
(m_x 0,0,0) | (9) m 2x,x,z
(m_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 i 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) x,y,\bar{z} [\bar{u},\bar{v},w]	(5) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$u-v,u,w$]
	(7) \bar{y},\bar{x},z [v,u,\bar{w}]	(8) $\bar{x}+y,y,z$ [$u-v,\bar{v},\bar{w}$]	(9) $x,x-y,z$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}$ [$u,u-v,\bar{w}$]
6 h .m.	x,\bar{x},z [$u,u,0$]	$x,2x,z$ [$\bar{u},0,0$]	$2\bar{x},\bar{x},z$ [$0,\bar{u},0$]
	x,\bar{x},\bar{z} [$\bar{u},\bar{u},0$]	$x,2x,\bar{z}$ [$u,0,0$]	$2\bar{x},\bar{x},\bar{z}$ [$0,u,0$]
6 g m..	$x,y,1/2$ [$0,0,w$]	$\bar{y},x-y,1/2$ [$0,0,w$]	$\bar{x}+y,\bar{x},1/2$ [$0,0,w$]
	$\bar{y},\bar{x},1/2$ [$0,0,\bar{w}$]	$\bar{x}+y,y,1/2$ [$0,0,\bar{w}$]	$x,x-y,1/2$ [$0,0,\bar{w}$]
6 f m..	$x,y,0$ [$0,0,w$]	$\bar{y},x-y,0$ [$0,0,w$]	$\bar{x}+y,\bar{x},0$ [$0,0,w$]
	$\bar{y},\bar{x},0$ [$0,0,\bar{w}$]	$\bar{x}+y,y,0$ [$0,0,\bar{w}$]	$x,x-y,0$ [$0,0,\bar{w}$]
3 e mm2	$x,\bar{x},1/2$ [$0,0,0$]	$x,2x,1/2$ [$0,0,0$]	$2\bar{x},\bar{x},1/2$ [$0,0,0$]
3 d mm2	$x,\bar{x},0$ [$0,0,0$]	$x,2x,0$ [$0,0,0$]	$2\bar{x},\bar{x},0$ [$0,0,0$]
2 c 3m.	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	
1 b $\bar{6}m2$	$0,0,1/2$ [$0,0,0$]		
1 a $\bar{6}m2$	$0,0,0$ [$0,0,0$]		

Continued

No. 71.1.357

$\bar{p}6m2$

Symmetry of special projections

Along [001] $3m1'$

Origin at 0,0,z

Along [100] $p1m11'$

$a^* = c$

Origin at x,0,0

Along [210] $p2mm$

$a^* = c$

Origin at x,x/2,0

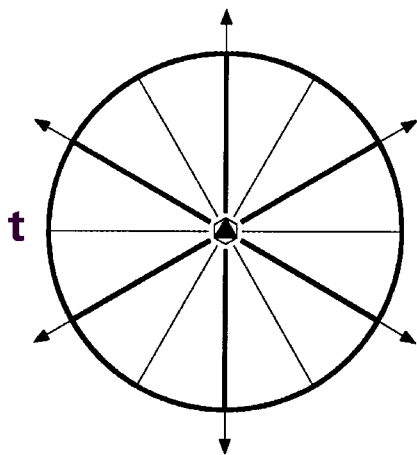
$\overline{p6}m21'$

$\overline{6}m21'$

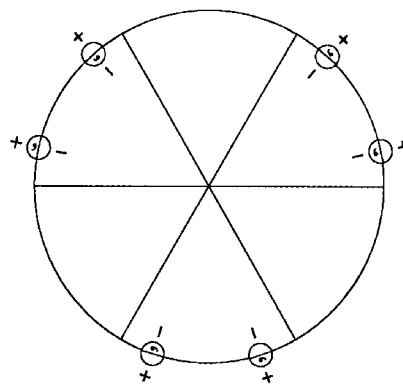
Hexagonal

No. 71.2.358

$\overline{p6}m21'$



1'



Origin on $\overline{6}m21'$

Asymmetric unit $y \leq x/2; y \geq -x; 0 \leq z \leq 1/2$

Symmetry operations

For 1 + set

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\overline{6}^-$ 0,0,z; 0,0,0
($\overline{6}_z^{-1}$ 0,0,0) | (6) $\overline{6}^+$ 0,0,z; 0,0,0
($\overline{6}_z$ 0,0,0) |
| (7) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (8) m x,2x,z
(m_x 0,0,0) | (9) m 2x,x,z
(m_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

For 1' + set

- | | | |
|---|--|---|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) m' x,y,0
(m_z 0,0,0)' | (5) $\overline{6}^{-'}$ 0,0,z; 0,0,0
($\overline{6}_z^{-1}$ 0,0,0)' | (6) $\overline{6}^{+'}$ 0,0,z; 0,0,0
($\overline{6}_z$ 0,0,0)' |
| (7) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (8) m' x,2x,z
(m_x 0,0,0)' | (9) m' 2x,x,z
(m_y 0,0,0)' |
| (10) 2' x, \bar{x} ,0
(2_3 0,0,0)' | (11) 2' x,2x,0
(2_2 0,0,0)' | (12) 2' 2x,x,0
(2_1 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$1+$	$1'+$
12 i $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) x,y,\bar{z} [0,0,0]	(5) $\bar{y},x-y,\bar{z}$ [0,0,0]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [0,0,0]
	(7) \bar{y},\bar{x},z [0,0,0]	(8) $\bar{x}+y,y,z$ [0,0,0]	(9) $x,x-y,z$ [0,0,0]
	(10) \bar{y},\bar{x},\bar{z} [0,0,0]	(11) $\bar{x}+y,y,\bar{z}$ [0,0,0]	(12) $x,x-y,\bar{z}$ [0,0,0]
6 h $.m.1'$	x,\bar{x},z [0,0,0]	$x,2x,z$ [0,0,0]	$2\bar{x},\bar{x},z$ [0,0,0]
	x,\bar{x},\bar{z} [0,0,0]	$x,2x,\bar{z}$ [0,0,0]	$2\bar{x},\bar{x},\bar{z}$ [0,0,0]
6 g $m..1'$	$x,y,1/2$ [0,0,0]	$\bar{y},x-y,1/2$ [0,0,0]	$\bar{x}+y,\bar{x},1/2$ [0,0,0]
	$\bar{y},\bar{x},1/2$ [0,0,0]	$\bar{x}+y,y,1/2$ [0,0,0]	$x,x-y,1/2$ [0,0,0]
6 f $m..1'$	$x,y,0$ [0,0,0]	$\bar{y},x-y,0$ [0,0,0]	$\bar{x}+y,\bar{x},0$ [0,0,0]
	$\bar{y},\bar{x},0$ [0,0,0]	$\bar{x}+y,y,0$ [0,0,0]	$x,x-y,0$ [0,0,0]
3 e $mm21'$	$x,\bar{x},1/2$ [0,0,0]	$x,2x,1/2$ [0,0,0]	$2\bar{x},\bar{x},1/2$ [0,0,0]
3 d $mm21'$	$x,\bar{x},0$ [0,0,0]	$x,2x,0$ [0,0,0]	$2\bar{x},\bar{x},0$ [0,0,0]
2 c $3m.1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
1 b $\overline{6m}21'$	$0,0,1/2$ [0,0,0]		
1 a $\overline{6m}21'$	$0,0,0$ [0,0,0]		

Continued

No. 71.2.358

$\bar{p}6m21'$

Symmetry of special projections

Along [001] $3m1'$

Origin at 0,0,z

Along [100] $p1m11'$

$a^* = c$

Origin at x,0,0

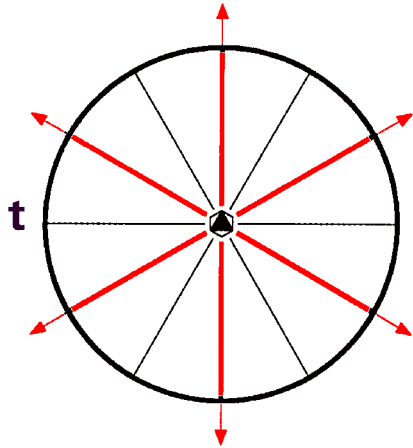
Along [210] $p2mm1'$

$a^* = c$

Origin at x,x/2,0

$\rho\bar{6}m'2'$

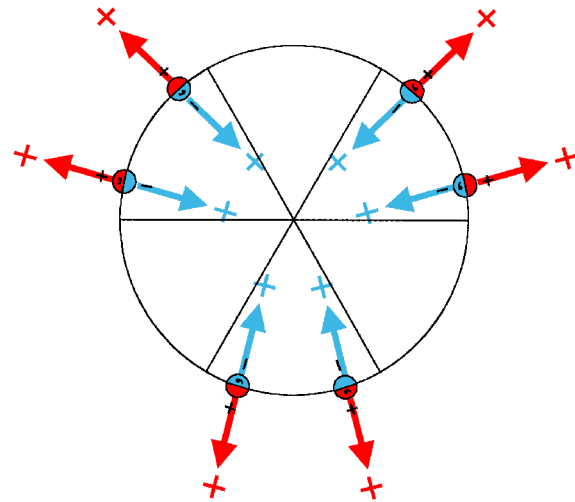
No. 71.3.359



$\bar{6}m'2'$

$\rho\bar{6}m'2'$

Hexagonal



Origin on $\bar{6}m'2'$

Asymmetric unit $y \leq x/2; y \geq -x; 0 \leq z \leq 1/2$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (7) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (8) m' x,2x,z
(m_x 0,0,0)' | (9) m' 2x,x,z
(m_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 i 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) x,y,\bar{z} [\bar{u},\bar{v},w]	(5) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [u-v,u,w]
	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) $\bar{x}+y,y,z$ [$\bar{u}+v,v,w$]	(9) $x,x-y,z$ [u,u-v,w]
	(10) \bar{y},\bar{x},\bar{z} [v,u,w]	(11) $\bar{x}+y,y,\bar{z}$ [u-v, \bar{v},w]	(12) $x,x-y,\bar{z}$ [$\bar{u},\bar{u}+v,w$]
6 h .m'	x,\bar{x},z [u, \bar{u},w]	$x,2x,z$ [u,2u,w]	$2\bar{x},\bar{x},z$ [2 \bar{u},\bar{u},w]
	x,\bar{x},\bar{z} [\bar{u},u,w]	$x,2x,\bar{z}$ [$\bar{u},2\bar{u},w$]	$2\bar{x},\bar{x},\bar{z}$ [2u,u,w]
6 g m..	$x,y,1/2$ [0,0,w]	$\bar{y},x-y,1/2$ [0,0,w]	$\bar{x}+y,\bar{x},1/2$ [0,0,w]
	$\bar{y},\bar{x},1/2$ [0,0,w]	$\bar{x}+y,y,1/2$ [0,0,w]	$x,x-y,1/2$ [0,0,w]
6 f m..	$x,y,0$ [0,0,w]	$\bar{y},x-y,0$ [0,0,w]	$\bar{x}+y,\bar{x},0$ [0,0,w]
	$\bar{y},\bar{x},0$ [0,0,w]	$\bar{x}+y,y,0$ [0,0,w]	$x,x-y,0$ [0,0,w]
3 e mm'2'	$x,\bar{x},1/2$ [0,0,w]	$x,2x,1/2$ [0,0,w]	$2\bar{x},\bar{x},1/2$ [0,0,w]
3 d mm'2'	$x,\bar{x},0$ [0,0,w]	$x,2x,0$ [0,0,w]	$2\bar{x},\bar{x},0$ [0,0,w]
2 c 3m'	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	
1 b $\bar{6}m'2'$	$0,0,1/2$ [0,0,w]		
1 a $\bar{6}m'2'$	$0,0,0$ [0,0,w]		

Continued

No. 71.3.359

$\bar{p}6m'2'$

Symmetry of special projections

Along [001] $3m'1'$

Origin at 0,0,z

Along [100] $p1m1$

$a^* = c$

Origin at x,0,0

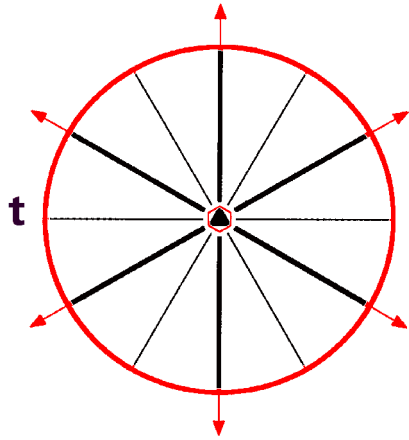
Along [210] $p2'mm'$

$a^* = c$

Origin at x,x/2,0

$\bar{p}\bar{6}'m2'$

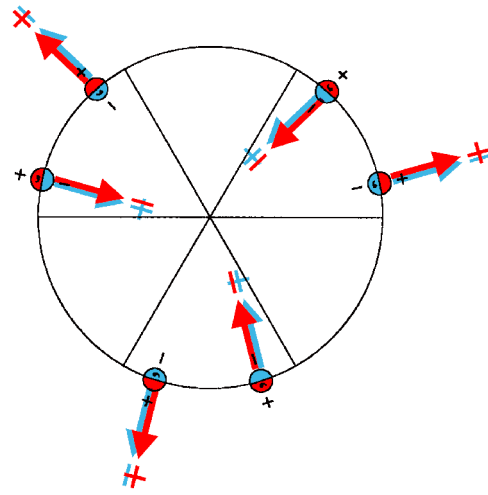
No. 71.4.360



$\bar{6}'m2'$

$\bar{p}\bar{6}'m2'$

Hexagonal



Origin on $\bar{6}'m2'$

Asymmetric unit $y \leq x/2; y \geq -x; 0 \leq z \leq 1/2$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m' x,y,0
(m_z 0,0,0)' | (5) $\bar{6}^-'$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (6) $\bar{6}^+'$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (7) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (8) m x,2x,z
(m_x 0,0,0) | (9) m 2x,x,z
(m_y 0,0,0) |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 i 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) x,y, \bar{z} [u,v, \bar{w}]	(5) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) \bar{y},\bar{x},z [v,u, \bar{w}]	(8) $\bar{x}+y,y,z$ [u-v, \bar{v},\bar{w}]	(9) x,x-y,z [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) \bar{y},\bar{x},\bar{z} [v,u,w]	(11) $\bar{x}+y,y,\bar{z}$ [u-v, \bar{v},w]	(12) x,x-y, \bar{z} [$\bar{u},\bar{u}+v,w$]
6 h .m.	x, \bar{x},z [u,u,0]	x,2x,z [$\bar{u},0,0$]	2 \bar{x},\bar{x},z [0, $\bar{u},0$]
	x, \bar{x},\bar{z} [u,u,0]	x,2x, \bar{z} [$\bar{u},0,0$]	2 \bar{x},\bar{x},\bar{z} [0, $\bar{u},0$]
6 g m'..	x,y,1/2 [u,v,0]	$\bar{y},x-y,1/2$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/2$ [$\bar{u}+v,\bar{u},0$]
	$\bar{y},\bar{x},1/2$ [v,u,0]	$\bar{x}+y,y,1/2$ [u-v, $\bar{v},0$]	x,x-y,1/2 [$\bar{u},\bar{u}+v,0$]
6 f m'..	x,y,0 [u,v,0]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{y},\bar{x},0$ [v,u,0]	$\bar{x}+y,y,0$ [u-v, $\bar{v},0$]	x,x-y,0 [$\bar{u},\bar{u}+v,0$]
3 e m'm2'	x, $\bar{x},1/2$ [u,u,0]	x,2x,1/2 [$\bar{u},0,0$]	2 $\bar{x},\bar{x},1/2$ [0, $\bar{u},0$]
3 d m'm2'	x, $\bar{x},0$ [u,u,0]	x,2x,0 [$\bar{u},0,0$]	2 $\bar{x},\bar{x},0$ [0, $\bar{u},0$]
2 c 3m.	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]	
1 b $\bar{6}'m2'$	0,0,1/2 [0,0,0]		
1 a $\bar{6}'m2'$	0,0,0 [0,0,0]		

Continued

No. 71.4.360

$\bar{p}6'm2'$

Symmetry of special projections

Along [001] $3m$

Origin at 0,0,z

Along [100] $p1m1'$

$a^* = c$

Origin at x,0,0

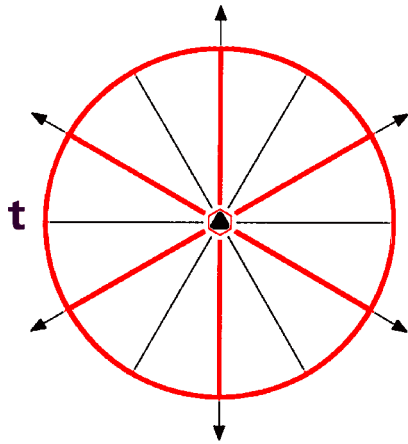
Along [210] $p2'm'm$

$a^* = c$

Origin at x,x/2,0

$\rho\bar{6}'m'2'$

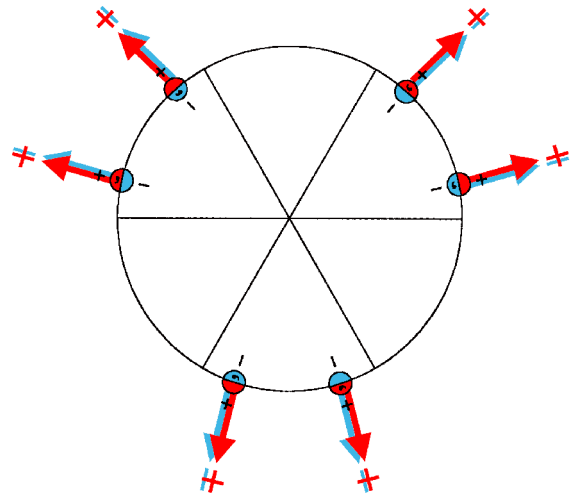
No. 71.5.361



$\bar{6}'m'2'$

$\rho\bar{6}'m'2'$

Hexagonal



Origin on $\bar{6}'m'2'$

Asymmetric unit $y \leq x/2; y \geq -x; 0 \leq z \leq 1/2$

Symmetry operations

- | | | |
|---|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m' x,y,0
(m_z 0,0,0)' | (5) $\bar{6}'$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (7) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (8) m' x,2x,z
(m_x 0,0,0)' | (9) m' 2x,x,z
(m_y 0,0,0)' |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 i 1	(1) x,y,z $[u,v,w]$	(2) $\bar{y},x-y,z$ $[\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z$ $[\bar{u}+v,\bar{u},w]$
	(4) x,y,\bar{z} $[u,v,\bar{w}]$	(5) $\bar{y},x-y,\bar{z}$ $[\bar{v},u-v,\bar{w}]$	(6) $\bar{x}+y,\bar{x},\bar{z}$ $[\bar{u}+v,\bar{u},\bar{w}]$
	(7) \bar{y},\bar{x},z $[\bar{v},\bar{u},w]$	(8) $\bar{x}+y,y,z$ $[\bar{u}+v,v,w]$	(9) $x,x-y,z$ $[u,u-v,w]$
	(10) \bar{y},\bar{x},\bar{z} $[\bar{v},\bar{u},\bar{w}]$	(11) $\bar{x}+y,y,\bar{z}$ $[\bar{u}+v,v,\bar{w}]$	(12) $x,x-y,\bar{z}$ $[u,u-v,\bar{w}]$
6 h .m'	x,\bar{x},z $[u,\bar{u},w]$	$x,2x,z$ $[u,2u,w]$	$2\bar{x},\bar{x},z$ $[2\bar{u},\bar{u},w]$
	x,\bar{x},\bar{z} $[u,\bar{u},\bar{w}]$	$x,2x,\bar{z}$ $[u,2u,\bar{w}]$	$2\bar{x},\bar{x},\bar{z}$ $[2\bar{u},\bar{u},\bar{w}]$
6 g m'..	$x,y,1/2$ $[u,v,0]$	$\bar{y},x-y,1/2$ $[\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},1/2$ $[\bar{u}+v,\bar{u},0]$
	$\bar{y},\bar{x},1/2$ $[\bar{v},\bar{u},0]$	$\bar{x}+y,y,1/2$ $[\bar{u}+v,v,0]$	$x,x-y,1/2$ $[u,u-v,0]$
6 f m'..	$x,y,0$ $[u,v,0]$	$\bar{y},x-y,0$ $[\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},0$ $[\bar{u}+v,\bar{u},0]$
	$\bar{y},\bar{x},0$ $[\bar{v},\bar{u},0]$	$\bar{x}+y,y,0$ $[\bar{u}+v,v,0]$	$x,x-y,0$ $[u,u-v,0]$
3 e m'm'2	$x,\bar{x},1/2$ $[u,\bar{u},0]$	$x,2x,1/2$ $[u,2u,0]$	$2\bar{x},\bar{x},1/2$ $[2\bar{u},\bar{u},0]$
3 d m'm'2	$x,\bar{x},0$ $[u,\bar{u},0]$	$x,2x,0$ $[u,2u,0]$	$2\bar{x},\bar{x},0$ $[2\bar{u},\bar{u},0]$
2 c 3m'	$0,0,z$ $[0,0,w]$	$0,0,\bar{z}$ $[0,0,\bar{w}]$	
1 b $\bar{6}'m'2$	$0,0,1/2$ $[0,0,0]$		
1 a $\bar{6}'m'2$	$0,0,0$ $[0,0,0]$		

Continued

No. 71.5.361

$\bar{p}6'm'2$

Symmetry of special projections

Along [001] $3m'$

Origin at 0,0,z

Along [100] $p1m'1$

$a^* = c$

Origin at x,0,0

Along [210] $p2m'm'$

$a^* = c$

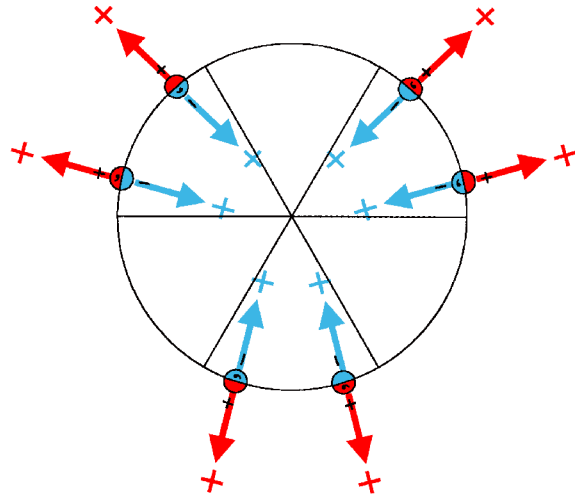
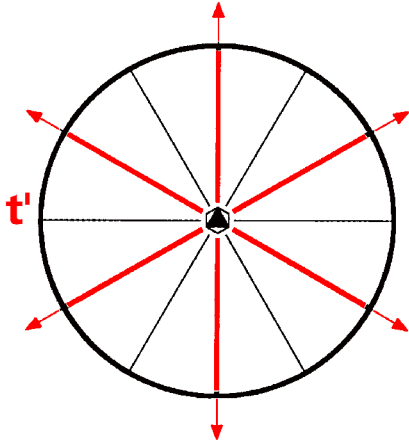
Origin at x,x/2,0

$\rho_{2c}\bar{6}m'2'$

No. 71.6.362

 $\bar{6}m21'$ $\rho_{2c}\bar{6}m'2'$

Hexagonal

Origin on $\bar{6}m'2'$ Asymmetric unit $y \leq x/2$; $y \geq -x$; $0 \leq z \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (7) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (8) m' x,2x,z
(m_x 0,0,0)' | (9) m' 2x,x,z
(m_y 0,0,0)' |
| (10) 2' x, \bar{x} ,0
(2_3 0,0,0)' | (11) 2' x,2x,0
(2_2 0,0,0)' | (12) 2' 2x,x,0
(2_1 0,0,0)' |

For (0,0,1)' + set

- | | | |
|---|--|---|
| (1) t' (0,0,1)
(1 0,0,0)' | (2) $3^{+'}$ (0,0,1) 0,0,z
(3_z 0,0,1)' | (3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} 0,0,1)' |
| (4) m' x,y,1/2
(m_z 0,0,1)' | (5) $\bar{6}^{-'}$ 0,0,z; 0,0,1/2
($\bar{6}_z^{-1}$ 0,0,1)' | (6) $\bar{6}^{+'}$ 0,0,z; 0,0,1/2
($\bar{6}_z$ 0,0,1)' |
| (7) c (0,0,1) x, \bar{x} ,z
(m_{xy} 0,0,1) | (8) c (0,0,1) x,2x,z
(m_x 0,0,1) | (9) c (0,0,1) 2x,x,z
(m_y 0,0,1) |
| (10) 2 x, \bar{x} ,1/2
(2_3 0,0,1) | (11) 2 x,2x,1/2
(2_2 0,0,1) | (12) 2 2x,x,1/2
(2_1 0,0,1) |

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
12 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(5) $\bar{y},x-y,\bar{z} [v,\bar{u}+v,w]$	(6) $\bar{x}+y,\bar{x},\bar{z} [u-v,u,w]$
	(7) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(8) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(9) $x,x-y,z [u,u-v,w]$
	(10) $\bar{y},\bar{x},\bar{z} [v,u,w]$	(11) $\bar{x}+y,y,\bar{z} [u-v,\bar{v},w]$	(12) $x,x-y,\bar{z} [\bar{u},\bar{u}+v,w]$
6 h .m'	$x,\bar{x},z [u,\bar{u},w]$	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$
	$x,\bar{x},\bar{z} [\bar{u},u,w]$	$x,2x,\bar{z} [\bar{u},2\bar{u},w]$	$2\bar{x},\bar{x},\bar{z} [2u,u,w]$
6 g m'..	$x,y,1/2 [u,v,0]$	$\bar{y},x-y,1/2 [\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},1/2 [\bar{u}+v,\bar{u},0]$
	$\bar{y},\bar{x},1/2 [\bar{v},\bar{u},0]$	$\bar{x}+y,y,1/2 [\bar{u}+v,v,0]$	$x,x-y,1/2 [u,u-v,0]$
6 f m..	$x,y,0 [0,0,w]$	$\bar{y},x-y,0 [0,0,w]$	$\bar{x}+y,\bar{x},0 [0,0,w]$
	$\bar{y},\bar{x},0 [0,0,w]$	$\bar{x}+y,y,0 [0,0,w]$	$x,x-y,0 [0,0,w]$
3 e m'm'2	$x,\bar{x},1/2 [u,\bar{u},0]$	$x,2x,1/2 [u,2u,0]$	$2\bar{x},\bar{x},1/2 [2\bar{u},\bar{u},0]$
3 d mm'2'	$x,\bar{x},0 [0,0,w]$	$x,2x,0 [0,0,w]$	$2\bar{x},\bar{x},0 [0,0,w]$
2 c 3m'	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$	
1 b $\bar{6}m'2$	$0,0,1/2 [0,0,0]$		
1 a $\bar{6}m'2'$	$0,0,0 [0,0,w]$		

Continued

No. 71.6.362

$p_{2c} \bar{6}m'2'$

Symmetry of special projections

Along [001] $3m'1'$

Origin at 0,0,z

Along [100] $p_{2a^*} 1m1$

$a^* = c$

Origin at x,0,0

Along [210] $p_{2a^*} 2'mm'$

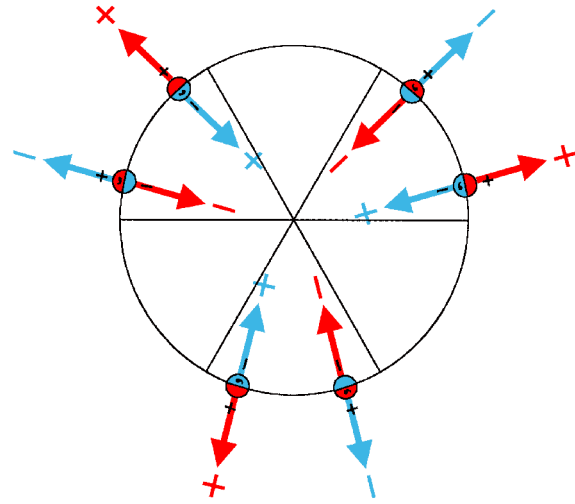
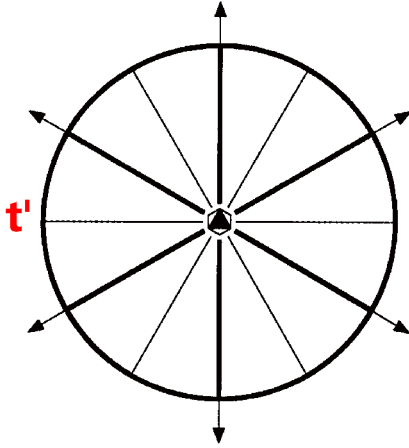
$a^* = c$

Origin at x,x/2,0

$\rho_{2c} \bar{6}m2$ $\bar{6}m21'$

Hexagonal

No. 71.7.363

 $\rho_{2c} \bar{6}m2$ Origin on $\bar{6}m2$ Asymmetric unit $y \leq x/2$; $y \geq -x$; $0 \leq z \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m x,y,0
(m_z |0,0,0)

(5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ |0,0,0)

(6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ |0,0,0)

(7) m x, \bar{x} ,z
(m_{xy} |0,0,0)

(8) m x,2x,z
(m_x |0,0,0)

(9) m 2x,x,z
(m_y |0,0,0)

(10) 2 x, \bar{x} ,0
(2_3 |0,0,0)

(11) 2 x,2x,0
(2_2 |0,0,0)

(12) 2 2x,x,0
(2_1 |0,0,0)

For (0,0,1)' + set

(1) t' (0,0,1)
(1|0,0,0)'

(2) $3^{+'}$ (0,0,1) 0,0,z
(3_z |0,0,1)'

(3) $3^{-'}$ (0,0,1) 0,0,z
(3_z^{-1} |0,0,1)'

(4) m' x,y,1/2
(m_z |0,0,1)'

(5) $\bar{6}^{-'}$ 0,0,z; 0,0,1/2
($\bar{6}_z^{-1}$ |0,0,1)'

(6) $\bar{6}^{+'}$ 0,0,z; 0,0,1/2
($\bar{6}_z$ |0,0,1)'

(7) c' (0,0,1) x, \bar{x} ,z
(m_{xy} |0,0,1)'

(8) c' (0,0,1) x,2x,z
(m_x |0,0,1)'

(9) c' (0,0,1) 2x,x,z
(m_y |0,0,1)'

(10) 2' x, \bar{x} ,1/2
(2_3 |0,0,1)'

(11) 2' x,2x,1/2
(2_2 |0,0,1)'

(12) 2' 2x,x,1/2
(2_1 |0,0,1)'

Generators selected (1); $t(0,0,1)'$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0) ⁺	(0,0,1)' +
12 i 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) x,y,\bar{z} [\bar{u},\bar{v},w]	(5) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$u-v,u,w$]
	(7) \bar{y},\bar{x},z [v,u,\bar{w}]	(8) $\bar{x}+y,y,z$ [$u-v,\bar{v},\bar{w}$]	(9) $x,x-y,z$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}$ [$u,u-v,\bar{w}$]
6 h .m.	x,\bar{x},z [u,u,0]	$x,2x,z$ [$\bar{u},0,0$]	$2\bar{x},\bar{x},z$ [0, $\bar{u},0$]
	x,\bar{x},\bar{z} [$\bar{u},\bar{u},0$]	$x,2x,\bar{z}$ [u,0,0]	$2\bar{x},\bar{x},\bar{z}$ [0,u,0]
6 g m'..	$x,y,1/2$ [u,v,0]	$\bar{y},x-y,1/2$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/2$ [$\bar{u}+v,\bar{u},0$]
	$\bar{y},\bar{x},1/2$ [v,u,0]	$\bar{x}+y,y,1/2$ [$u-v,\bar{v},0$]	$x,x-y,1/2$ [$\bar{u},\bar{u}+v,0$]
6 f m..	$x,y,0$ [0,0,w]	$\bar{y},x-y,0$ [0,0,w]	$\bar{x}+y,\bar{x},0$ [0,0,w]
	$\bar{y},\bar{x},0$ [0,0, \bar{w}]	$\bar{x}+y,y,0$ [0,0, \bar{w}]	$x,x-y,0$ [0,0, \bar{w}]
3 e m'm2'	$x,\bar{x},1/2$ [u,u,0]	$x,2x,1/2$ [$\bar{u},0,0$]	$2\bar{x},\bar{x},1/2$ [0, $\bar{u},0$]
3 d mm2	$x,\bar{x},0$ [u, $\bar{u},0$]	$x,2x,0$ [u,2u,0]	$2\bar{x},\bar{x},0$ [2 $\bar{u},\bar{u},0$]
2 c 3m.	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]	
1 b $\bar{6}m2'$	0,0,1/2 [0,0,0]		
1 a $\bar{6}m2$	0,0,0 [0,0,0]		

Continued

No. 71.7.363

$p_{2c}\bar{6}m2$

Symmetry of special projections

Along [001] $3m1'$

Origin at 0,0,z

Along [100] $p1m11'$

$a^* = c$

Origin at x,0,0

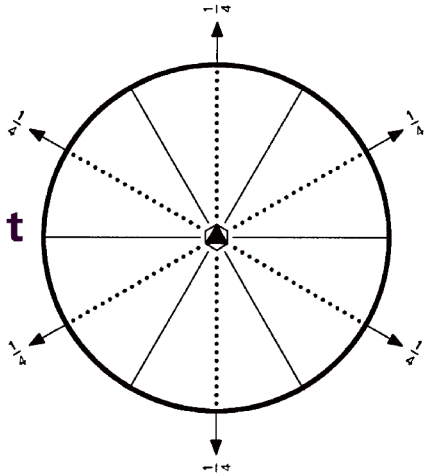
Along [210] $p_{2a^*}2mm$

$a^* = c$

Origin at x,x/2,0

$\overline{p6c2}$

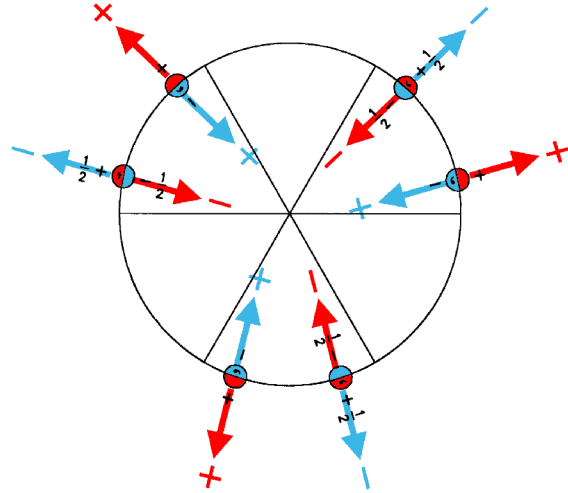
No. 72.1.364



$\overline{6m2}$

$\overline{p6c2}$

Hexagonal



Origin on $\overline{6c1}$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\overline{6}^-$ 0,0,z; 0,0,0
($\overline{6}_z^{-1}$ 0,0,0) | (6) $\overline{6}^+$ 0,0,z; 0,0,0
($\overline{6}_z$ 0,0,0) |
| (7) c (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2) | (8) c (0,0,1/2) x,2x,z
(m_x 0,0,1/2) | (9) c (0,0,1/2) 2x,x,z
(m_y 0,0,1/2) |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) x,y,\bar{z} [\bar{u},\bar{v},w]	(5) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$u-v,u,w$]
	(7) $\bar{y},\bar{x},z+1/2$ [v,u,\bar{w}]	(8) $\bar{x}+y,y,z+1/2$ [$u-v,\bar{v},\bar{w}$]	(9) $x,x-y,z+1/2$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/2$ [$u,u-v,\bar{w}$]
6 e m..	$x,y,0$ [$0,0,w$]	$\bar{y},x-y,0$ [$0,0,w$]	$\bar{x}+y,\bar{x},0$ [$0,0,w$]
	$\bar{y},\bar{x},1/2$ [$0,0,\bar{w}$]	$\bar{x}+y,y,1/2$ [$0,0,\bar{w}$]	$x,x-y,1/2$ [$0,0,\bar{w}$]
6 d ..2	$x,\bar{x},1/4$ [$u,\bar{u},0$]	$x,2x,1/4$ [$u,2u,0$]	$2\bar{x},\bar{x},1/4$ [$2\bar{u},\bar{u},0$]
	$x,\bar{x},3/4$ [$\bar{u},u,0$]	$x,2x,3/4$ [$\bar{u},2\bar{u},0$]	$2\bar{x},\bar{x},3/4$ [$2u,u,0$]
4 c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]	
	$0,0,z+1/2$ [$0,0,\bar{w}$]	$0,0,\bar{z}+1/2$ [$0,0,\bar{w}$]	
2 b $\bar{6}$..	$0,0,0$ [$0,0,w$]	$0,0,1/2$ [$0,0,\bar{w}$]	
2 a 3.2	$0,0,1/4$ [$0,0,0$]	$0,0,3/4$ [$0,0,0$]	

Symmetry of special projections

Along [001] $3m1'$	Along [100] $p_{2a^*}1m1$	Along [210] $p2mg$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,1/4$

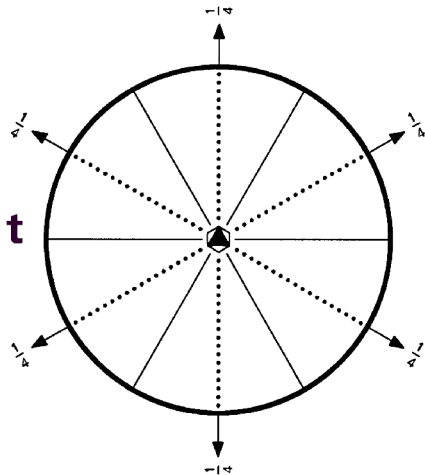
$\bar{p}\bar{6}c21'$

$\bar{6}m21'$

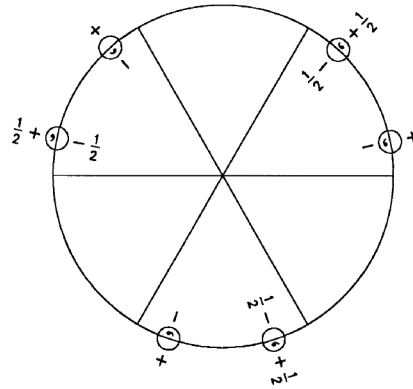
Hexagonal

No. 72.2.365

$\bar{p}\bar{6}c21'$



1'



Origin on $\bar{6}c11'$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

For 1 + set

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (7) c (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2) | (8) c (0,0,1/2) x,2x,z
(m_x 0,0,1/2) | (9) c (0,0,1/2) 2x,x,z
(m_y 0,0,1/2) |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |

For 1' + set

- | | | |
|---|--|---|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) m' x,y,0
(m_z 0,0,0)' | (5) $\bar{6}^{-'}$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (6) $\bar{6}^{+'}$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (7) c' (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2)' | (8) c' (0,0,1/2) x,2x,z
(m_x 0,0,1/2)' | (9) c' (0,0,1/2) 2x,x,z
(m_y 0,0,1/2)' |
| (10) 2' x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) 2' x,2x,1/4
(2_2 0,0,1/2)' | (12) 2' 2x,x,1/4
(2_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); $1'$

Positions

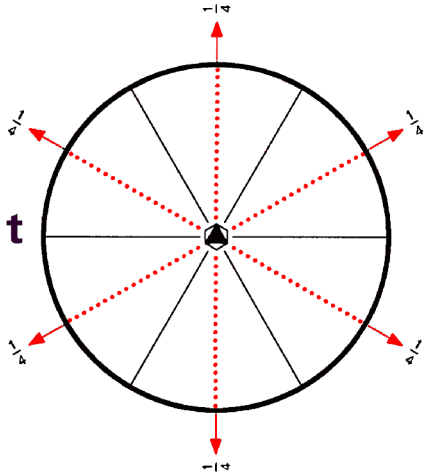
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		$1+$	$1'+$
12 f $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) x,y,\bar{z} [0,0,0]	(5) $\bar{y},x-y,\bar{z}$ [0,0,0]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [0,0,0]
	(7) $\bar{y},\bar{x},z+1/2$ [0,0,0]	(8) $\bar{x}+y,y,z+1/2$ [0,0,0]	(9) $x,x-y,z+1/2$ [0,0,0]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [0,0,0]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [0,0,0]	(12) $x,x-y,\bar{z}+1/2$ [0,0,0]
6 e $m..1'$	$x,y,0$ [0,0,0]	$\bar{y},x-y,0$ [0,0,0]	$\bar{x}+y,\bar{x},0$ [0,0,0]
	$\bar{y},\bar{x},1/2$ [0,0,0]	$\bar{x}+y,y,1/2$ [0,0,0]	$x,x-y,1/2$ [0,0,0]
6 d $..21'$	$x,\bar{x},1/4$ [0,0,0]	$x,2x,1/4$ [0,0,0]	$2\bar{x},\bar{x},1/4$ [0,0,0]
	$x,\bar{x},3/4$ [0,0,0]	$x,2x,3/4$ [0,0,0]	$2\bar{x},\bar{x},3/4$ [0,0,0]
4 c $3..1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
	$0,0,z+1/2$ [0,0,0]	$0,0,\bar{z}+1/2$ [0,0,0]	
2 b $\bar{6}..1'$	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	
2 a $3.21'$	$0,0,1/4$ [0,0,0]	$0,0,3/4$ [0,0,0]	

Symmetry of special projections

Along [001] $3m1'$	Along [100] $p1m11'$	Along [210] $p2mg1'$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,1/4$

$\overline{p6c}2'$

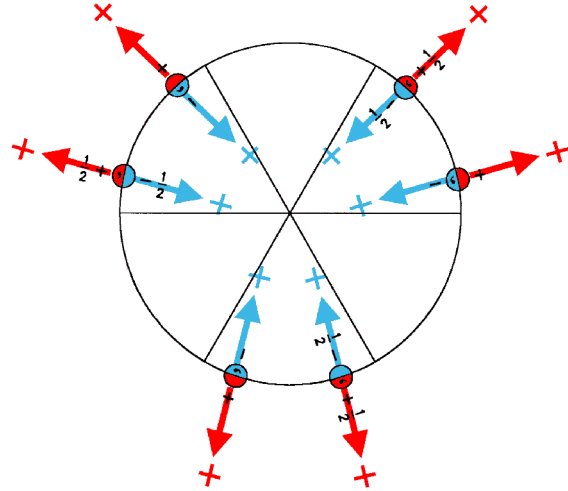
No. 72.3.366



$\overline{6m}2'$

$\overline{p6c}2'$

Hexagonal



Origin on $\overline{6c}1$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\overline{6}^-$ 0,0,z; 0,0,0
($\overline{6}_z^{-1}$ 0,0,0) | (6) $\overline{6}^+$ 0,0,z; 0,0,0
($\overline{6}_z$ 0,0,0) |
| (7) c' (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2)' | (8) c' (0,0,1/2) x,2x,z
(m_x 0,0,1/2)' | (9) c' (0,0,1/2) 2x,x,z
(m_y 0,0,1/2)' |
| (10) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (12) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

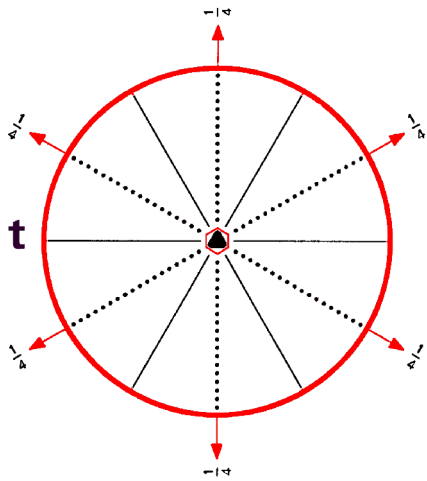
	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) x,y,\bar{z} [\bar{u},\bar{v},w]	(5) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$u-v,u,w$]
	(7) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{x}+y,y,z+1/2$ [$\bar{u}+v,v,w$]	(9) $x,x-y,z+1/2$ [$u,u-v,w$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$u-v,\bar{v},w$]	(12) $x,x-y,\bar{z}+1/2$ [$\bar{u},\bar{u}+v,w$]
6 e m..	$x,y,0$ [$0,0,w$]	$\bar{y},x-y,0$ [$0,0,w$]	$\bar{x}+y,\bar{x},0$ [$0,0,w$]
	$\bar{y},\bar{x},1/2$ [$0,0,w$]	$\bar{x}+y,y,1/2$ [$0,0,w$]	$x,x-y,1/2$ [$0,0,w$]
6 d ..2'	$x,\bar{x},1/4$ [u,u,w]	$x,2x,1/4$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/4$ [$0,\bar{u},w$]
	$x,\bar{x},3/4$ [\bar{u},\bar{u},w]	$x,2x,3/4$ [$u,0,w$]	$2\bar{x},\bar{x},3/4$ [$0,u,w$]
4 c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]	
	$0,0,z+1/2$ [$0,0,w$]	$0,0,\bar{z}+1/2$ [$0,0,w$]	
2 b $\bar{6}$..	$0,0,0$ [$0,0,w$]	$0,0,1/2$ [$0,0,w$]	
2 a 3.2'	$0,0,1/4$ [$0,0,w$]	$0,0,3/4$ [$0,0,w$]	

Symmetry of special projections

Along [001] $3m1'$	Along [100] $p1m1$	Along [210] $p2'mg'$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,1/4$

$\bar{p}\bar{6}'c2'$

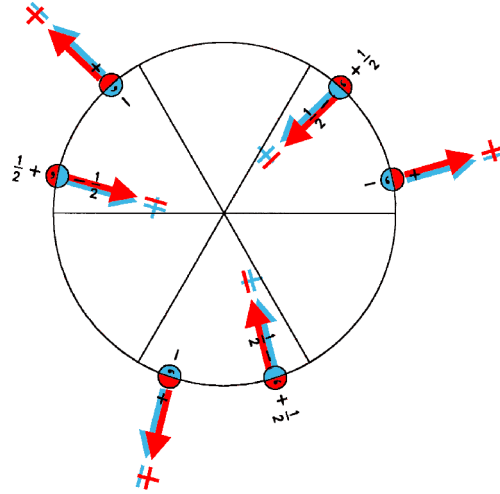
No. 72.4.367



$\bar{6}'m2'$

$\bar{p}\bar{6}'c2'$

Hexagonal



Origin on $\bar{6}'c1$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m' x,y,0
(m_z 0,0,0)' | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (7) c (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2) | (8) c (0,0,1/2) x,2x,z
(m_x 0,0,1/2) | (9) c (0,0,1/2) 2x,x,z
(m_y 0,0,1/2) |
| (10) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (12) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

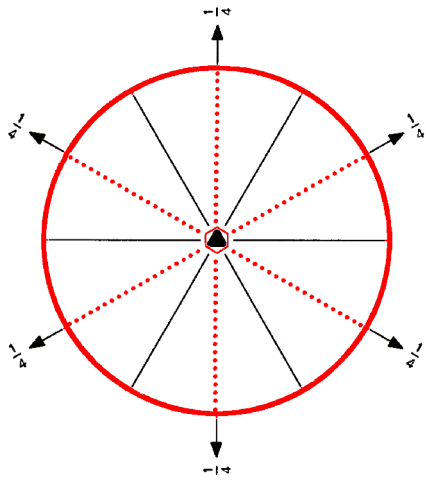
	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) x,y,\bar{z} [u,v, \bar{w}]	(5) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) $\bar{y},\bar{x},z+1/2$ [v,u, \bar{w}]	(8) $\bar{x}+y,y,z+1/2$ [u-v, \bar{v},\bar{w}]	(9) $x,x-y,z+1/2$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [u-v, \bar{v},w]	(12) $x,x-y,\bar{z}+1/2$ [$\bar{u},\bar{u}+v,w$]
6 e m'..	$x,y,0$ [u,v,0]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{y},\bar{x},1/2$ [v,u,0]	$\bar{x}+y,y,1/2$ [u-v, $\bar{v},0$]	$x,x-y,1/2$ [$\bar{u},\bar{u}+v,0$]
6 d ..2'	$x,\bar{x},1/4$ [u,u,w]	$x,2x,1/4$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},1/4$ [0, \bar{u},w]
	$x,\bar{x},3/4$ [u,u, \bar{w}]	$x,2x,3/4$ [0, \bar{u},\bar{w}]	$2\bar{x},\bar{x},3/4$ [$\bar{u},0,\bar{w}$]
4 c 3..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]	
	$0,0,z+1/2$ [0,0, \bar{w}]	$0,0,\bar{z}+1/2$ [0,0,w]	
2 b $\bar{6}'..$	$0,0,0$ [0,0,0]	$0,0,1/2$ [0,0,0]	
2 a 3.2'	$0,0,1/4$ [0,0,w]	$0,0,3/4$ [0,0, \bar{w}]	

Symmetry of special projections

Along [001] 3m	Along [100] $p_{2a^*}1m'1$	Along [210] $p2'm'g$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c$ Origin at x,x/2,1/4

$\bar{p}\bar{6}'c'2$

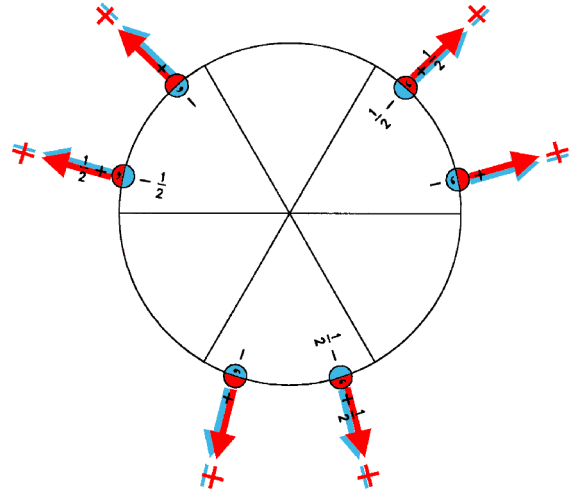
No. 72.5.368



$\bar{6}'m'2$

$\bar{p}\bar{6}'c'2$

Hexagonal



Origin on $\bar{6}'c'1$

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m' x,y,0
(m_z 0,0,0)' | (5) $\bar{6}'$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (6) $\bar{6}^{+'}$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (7) c' (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2)' | (8) c' (0,0,1/2) x,2x,z
(m_x 0,0,1/2)' | (9) c' (0,0,1/2) 2x,x,z
(m_y 0,0,1/2)' |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 f 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) x,y,\bar{z} [u,v,\bar{w}]	(5) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(8) $\bar{x}+y,y,z+1/2$ [$\bar{u}+v,v,w$]	(9) $x,x-y,z+1/2$ [$u,u-v,w$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/2$ [$u,u-v,\bar{w}$]
6 e m'..	$x,y,0$ [$u,v,0$]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{y},\bar{x},1/2$ [$\bar{v},\bar{u},0$]	$\bar{x}+y,y,1/2$ [$\bar{u}+v,v,0$]	$x,x-y,1/2$ [$u,u-v,0$]
6 d ..2	$x,\bar{x},1/4$ [$u,\bar{u},0$]	$x,2x,1/4$ [$u,2u,0$]	$2\bar{x},\bar{x},1/4$ [$2\bar{u},\bar{u},0$]
	$x,\bar{x},3/4$ [$u,\bar{u},0$]	$x,2x,3/4$ [$2\bar{u},\bar{u},0$]	$2\bar{x},\bar{x},3/4$ [$u,2u,0$]
4 c 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	
	$0,0,z+1/2$ [$0,0,w$]	$0,0,\bar{z}+1/2$ [$0,0,\bar{w}$]	
2 b $\bar{6}'..$	$0,0,0$ [$0,0,0$]	$0,0,1/2$ [$0,0,0$]	
2 a 3.2	$0,0,1/4$ [$0,0,0$]	$0,0,3/4$ [$0,0,0$]	

Symmetry of special projections

Along [001] $3m'$	Along [100] $p1m'1$	Along [210] $p2m'g'$
Origin at $0,0,z$	$a^* = c/2$ Origin at $x,0,0$	$a^* = c$ Origin at $x,x/2,1/4$

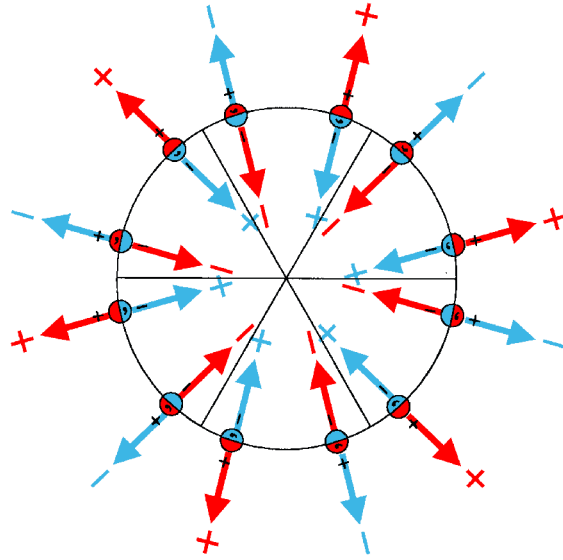
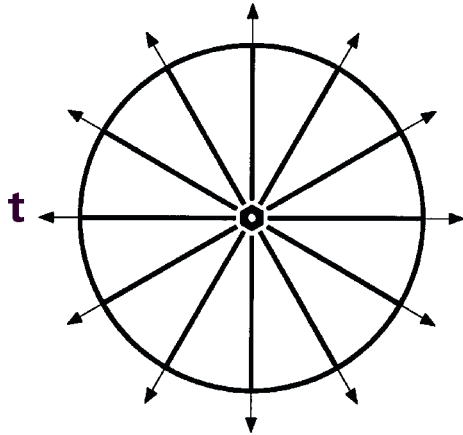
$p6/mmm$

$6/mmm$

Hexagonal

No. 73.1.369

$p6/m2/m2/m$



Origin at center ($6/mmm$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x/2$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) m x,x,z
(m_3 0,0,0) | (23) m x,0,z
(m_2 0,0,0) | (24) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
	(4) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]	(5) $y, \bar{x}+y, z$ [$v, \bar{u}+v, w$]	(6) $x-y, x, z$ [u-v,u,w]
	(7) y, x, \bar{z} [v,u, \bar{w}]	(8) $x-y, \bar{y}, \bar{z}$ [u-v, \bar{v}, \bar{w}]	(9) $\bar{x}, \bar{x}+y, \bar{z}$ [$\bar{u}, \bar{u}+v, \bar{w}$]
	(10) $\bar{y}, \bar{x}, \bar{z}$ [$\bar{v}, \bar{u}, \bar{w}$]	(11) $\bar{x}+y, y, \bar{z}$ [$\bar{u}+v, v, \bar{w}$]	(12) $x, x-y, \bar{z}$ [u,u-v, \bar{w}]
	(13) $\bar{x}, \bar{y}, \bar{z}$ [u,v,w]	(14) $y, \bar{x}+y, \bar{z}$ [$\bar{v}, u-v, w$]	(15) $x-y, x, \bar{z}$ [$\bar{u}+v, \bar{u}, w$]
	(16) x, y, \bar{z} [\bar{u}, \bar{v}, w]	(17) $\bar{y}, x-y, \bar{z}$ [$v, \bar{u}+v, w$]	(18) $\bar{x}+y, \bar{x}, \bar{z}$ [u-v,u,w]
	(19) \bar{y}, \bar{x}, z [v,u, \bar{w}]	(20) $\bar{x}+y, y, z$ [u-v, \bar{v}, \bar{w}]	(21) $x, x-y, z$ [$\bar{u}, \bar{u}+v, \bar{w}$]
	(22) y, x, z [$\bar{v}, \bar{u}, \bar{w}$]	(23) $x-y, \bar{y}, z$ [$\bar{u}+v, v, \bar{w}$]	(24) $\bar{x}, \bar{x}+y, z$ [u,u-v, \bar{w}]
12 k m..	$x, y, 1/2$ [0,0,w]	$\bar{y}, x-y, 1/2$ [0,0,w]	$\bar{x}+y, \bar{x}, 1/2$ [0,0,w]
	$\bar{x}, \bar{y}, 1/2$ [0,0,w]	$y, \bar{x}+y, 1/2$ [0,0,w]	$x-y, x, 1/2$ [0,0,w]
	$y, x, 1/2$ [0,0, \bar{w}]	$x-y, \bar{y}, 1/2$ [0,0, \bar{w}]	$\bar{x}, \bar{x}+y, 1/2$ [0,0, \bar{w}]
	$\bar{y}, \bar{x}, 1/2$ [0,0, \bar{w}]	$\bar{x}+y, y, 1/2$ [0,0, \bar{w}]	$x, x-y, 1/2$ [0,0, \bar{w}]
12 j m..	$x, y, 0$ [0,0,w]	$\bar{y}, x-y, 0$ [0,0,w]	$\bar{x}+y, \bar{x}, 0$ [0,0,w]
	$\bar{x}, \bar{y}, 0$ [0,0,w]	$y, \bar{x}+y, 0$ [0,0,w]	$x-y, x, 0$ [0,0,w]
	$y, x, 0$ [0,0, \bar{w}]	$x-y, \bar{y}, 0$ [0,0, \bar{w}]	$\bar{x}, \bar{x}+y, 0$ [0,0, \bar{w}]
	$\bar{y}, \bar{x}, 0$ [0,0, \bar{w}]	$\bar{x}+y, y, 0$ [0,0, \bar{w}]	$x, x-y, 0$ [0,0, \bar{w}]

Continued

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p6/mmm

12 i .m.	$x, 2x, z [u, 0, 0]$	$2\bar{x}, \bar{x}, z [0, u, 0]$	$x, \bar{x}, z [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 2\bar{x}, z [\bar{u}, 0, 0]$	$2x, x, z [0, \bar{u}, 0]$	$\bar{x}, x, z [u, u, 0]$
	$2x, x, \bar{z} [0, u, 0]$	$\bar{x}, 2\bar{x}, \bar{z} [u, 0, 0]$	$\bar{x}, x, \bar{z} [\bar{u}, \bar{u}, 0]$
	$2\bar{x}, \bar{x}, \bar{z} [0, \bar{u}, 0]$	$x, 2x, \bar{z} [\bar{u}, 0, 0]$	$x, \bar{x}, \bar{z} [u, u, 0]$
12 h .m	$x, 0, z [u, 2u, 0]$	$0, x, z [2\bar{u}, \bar{u}, 0]$	$\bar{x}, \bar{x}, z [u, \bar{u}, 0]$
	$\bar{x}, 0, z [\bar{u}, 2\bar{u}, 0]$	$0, \bar{x}, z [2u, u, 0]$	$x, x, z [\bar{u}, u, 0]$
	$0, x, \bar{z} [2u, u, 0]$	$x, 0, \bar{z} [\bar{u}, 2\bar{u}, 0]$	$\bar{x}, \bar{x}, \bar{z} [\bar{u}, u, 0]$
	$0, \bar{x}, \bar{z} [2\bar{u}, \bar{u}, 0]$	$\bar{x}, 0, \bar{z} [u, 2u, 0]$	$x, x, \bar{z} [u, \bar{u}, 0]$
6 g mm2	$x, 2x, 1/2 [0, 0, 0]$	$2\bar{x}, \bar{x}, 1/2 [0, 0, 0]$	$x, \bar{x}, 1/2 [0, 0, 0]$
	$\bar{x}, 2\bar{x}, 1/2 [0, 0, 0]$	$2x, x, 1/2 [0, 0, 0]$	$\bar{x}, x, 1/2 [0, 0, 0]$
6 f mm2	$x, 2x, 0 [0, 0, 0]$	$2\bar{x}, \bar{x}, 0 [0, 0, 0]$	$x, \bar{x}, 0 [0, 0, 0]$
	$\bar{x}, 2\bar{x}, 0 [0, 0, 0]$	$2x, x, 0 [0, 0, 0]$	$\bar{x}, x, 0 [0, 0, 0]$
6 e m2m	$x, 0, 1/2 [0, 0, 0]$	$0, x, 1/2 [0, 0, 0]$	$\bar{x}, \bar{x}, 1/2 [0, 0, 0]$
	$\bar{x}, 0, 1/2 [0, 0, 0]$	$0, \bar{x}, 1/2 [0, 0, 0]$	$x, x, 1/2 [0, 0, 0]$
6 d m2m	$x, 0, 0 [0, 0, 0]$	$0, x, 0 [0, 0, 0]$	$\bar{x}, \bar{x}, 0 [0, 0, 0]$
	$\bar{x}, 0, 0 [0, 0, 0]$	$0, \bar{x}, 0 [0, 0, 0]$	$x, x, 0 [0, 0, 0]$
2 c 6mm	$0, 0, z [0, 0, 0]$	$0, 0, \bar{z} [0, 0, 0]$	
1 b 6/mmm	$0, 0, 1/2 [0, 0, 0]$		
1 a 6/mmm	$0, 0, 0 [0, 0, 0]$		

Continued

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p6/mmm

Symmetry of special projections

Along [001] 6mm

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

Along [210] $p2mm1'$

$a^* = c$

Origin at x,x/2,0

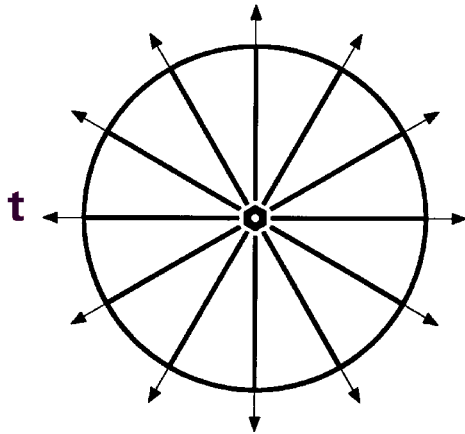
$p6/mmm1'$

$6/mmm1'$

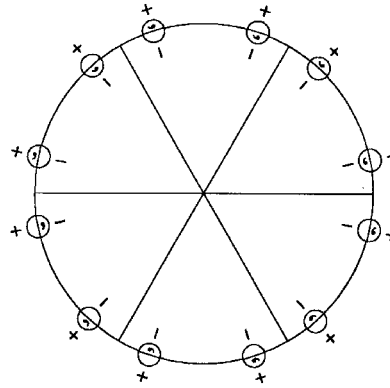
Hexagonal

No. 73.2.370

$p6/m2/m2/m1'$



1'



Origin at center ($6/mmm$) $1'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x/2$

Symmetry operations

For $1 +$ set

- | | | |
|---|---|---|
| (1) 1
($1 0,0,0$) | (2) 3^+ $0,0,z$
($3_z 0,0,0$) | (3) 3^- $0,0,z$
($3_z^{-1} 0,0,0$) |
| (4) 2 $0,0,z$
($2_z 0,0,0$) | (5) 6^- $0,0,z$
($6_z^{-1} 0,0,0$) | (6) 6^+ $0,0,z$
($6_z 0,0,0$) |
| (7) 2 $x,x,0$
($2_{xy} 0,0,0$) | (8) 2 $x,0,0$
($2_x 0,0,0$) | (9) 2 $0,y,0$
($2_y 0,0,0$) |
| (10) 2 $x,\bar{x},0$
($2_3 0,0,0$) | (11) 2 $x,2x,0$
($2_2 0,0,0$) | (12) 2 $2x,x,0$
($2_1 0,0,0$) |
| (13) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (14) $\bar{3}^+$ $0,0,z; 0,0,0$
($\bar{3}_z 0,0,0$) | (15) $\bar{3}^-$ $0,0,z; 0,0,0$
($\bar{3}_z^{-1} 0,0,0$) |
| (16) m $x,y,0$
($m_z 0,0,0$) | (17) $\bar{6}^-$ $0,0,z; 0,0,0$
($\bar{6}_z^{-1} 0,0,0$) | (18) $\bar{6}^+$ $0,0,z; 0,0,0$
($\bar{6}_z 0,0,0$) |
| (19) m x,\bar{x},z
($m_{xy} 0,0,0$) | (20) m $x,2x,z$
($m_x 0,0,0$) | (21) m $2x,x,z$
($m_y 0,0,0$) |
| (22) m x,x,z
($m_3 0,0,0$) | (23) m $x,0,z$
($m_2 0,0,0$) | (24) m $0,y,z$
($m_1 0,0,0$) |

For 1' + set

$$(1) 1' \\ (1|0,0,0)'$$

$$(4) 2' \quad 0,0,z \\ (2_z|0,0,0)'$$

$$(7) 2' \quad x,x,0 \\ (2_{xy}|0,0,0)'$$

$$(10) 2' \quad x,\bar{x},0 \\ (2_3|0,0,0)'$$

$$(13) \bar{1}' \quad 0,0,0 \\ (\bar{1}|0,0,0)'$$

$$(16) m' \quad x,y,0 \\ (m_z|0,0,0)'$$

$$(19) m' \quad x,\bar{x},z \\ (m_{xy}|0,0,0)'$$

$$(22) m' \quad x,x,z \\ (m_3|0,0,0)'$$

$$(2) 3^{+'} \quad 0,0,z \\ (3_z|0,0,0)'$$

$$(5) 6^{-'} \quad 0,0,z \\ (6_z^{-1}|0,0,0)'$$

$$(8) 2' \quad x,0,0 \\ (2_x|0,0,0)'$$

$$(11) 2' \quad x,2x,0 \\ (2_2|0,0,0)'$$

$$(14) \bar{3}^{+'} \quad 0,0,z; 0,0,0 \\ (\bar{3}_z|0,0,0)'$$

$$(17) \bar{6}^{-'} \quad 0,0,z; 0,0,0 \\ (\bar{6}_z^{-1}|0,0,0)'$$

$$(20) m' \quad x,2x,z \\ (m_x|0,0,0)'$$

$$(23) m' \quad x,0,z \\ (m_2|0,0,0)'$$

$$(3) 3^{-'} \quad 0,0,z \\ (3_z^{-1}|0,0,0)'$$

$$(6) 6^{+'} \quad 0,0,z \\ (6_z|0,0,0)'$$

$$(9) 2' \quad 0,y,0 \\ (2_y|0,0,0)'$$

$$(12) 2' \quad 2x,x,0 \\ (2_1|0,0,0)'$$

$$(15) \bar{3}^{-'} \quad 0,0,z; 0,0,0 \\ (\bar{3}_z^{-1}|0,0,0)'$$

$$(18) \bar{6}^{+'} \quad 0,0,z; 0,0,0 \\ (\bar{6}_z|0,0,0)'$$

$$(21) m' \quad 2x,x,z \\ (m_y|0,0,0)'$$

$$(24) m' \quad 0,y,z \\ (m_1|0,0,0)'$$

Generators selected (1); t(0,0,1); (2); (4); (7); (13); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1' +
24 l 11'	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) \bar{x},\bar{y},z [0,0,0]	(5) $y,\bar{x}+y,z$ [0,0,0]	(6) x-y,x,z [0,0,0]
	(7) y,x, \bar{z} [0,0,0]	(8) x-y, \bar{y},\bar{z} [0,0,0]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [0,0,0]
	(10) \bar{y},\bar{x},\bar{z} [0,0,0]	(11) $\bar{x}+y,y,\bar{z}$ [0,0,0]	(12) x,x-y, \bar{z} [0,0,0]
	(13) \bar{x},\bar{y},\bar{z} [0,0,0]	(14) $y,\bar{x}+y,\bar{z}$ [0,0,0]	(15) x-y,x, \bar{z} [0,0,0]
	(16) x,y, \bar{z} [0,0,0]	(17) $\bar{y},x-y,\bar{z}$ [0,0,0]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [0,0,0]
	(19) \bar{y},\bar{x},z [0,0,0]	(20) $\bar{x}+y,y,z$ [0,0,0]	(21) x,x-y,z [0,0,0]
	(22) y,x,z [0,0,0]	(23) x-y, \bar{y},z [0,0,0]	(24) $\bar{x},\bar{x}+y,z$ [0,0,0]
12 k m..1'	x,y,1/2 [0,0,0]	$\bar{y},x-y,1/2$ [0,0,0]	$\bar{x}+y,\bar{x},1/2$ [0,0,0]
	$\bar{x},\bar{y},1/2$ [0,0,0]	$y,\bar{x}+y,1/2$ [0,0,0]	x-y,x,1/2 [0,0,0]
	y,x,1/2 [0,0,0]	x-y, $\bar{y},1/2$ [0,0,0]	$\bar{x},\bar{x}+y,1/2$ [0,0,0]
	$\bar{y},\bar{x},1/2$ [0,0,0]	$\bar{x}+y,y,1/2$ [0,0,0]	x,x-y,1/2 [0,0,0]
12 j m..1'	x,y,0 [0,0,0]	$\bar{y},x-y,0$ [0,0,0]	$\bar{x}+y,\bar{x},0$ [0,0,0]
	$\bar{x},\bar{y},0$ [0,0,0]	$y,\bar{x}+y,0$ [0,0,0]	x-y,x,0 [0,0,0]
	y,x,0 [0,0,0]	x-y, $\bar{y},0$ [0,0,0]	$\bar{x},\bar{x}+y,0$ [0,0,0]
	$\bar{y},\bar{x},0$ [0,0,0]	$\bar{x}+y,y,0$ [0,0,0]	x,x-y,0 [0,0,0]

Continued		No. 73.2.370	<i>p6/mmm1'</i>
12 i .m.1'	x,2x,z [0,0,0]	2 \bar{x} , \bar{x} ,z [0,0,0]	x, \bar{x} ,z [0,0,0]
	\bar{x} ,2 \bar{x} ,z [0,0,0]	2x,x,z [0,0,0]	\bar{x} ,x,z [0,0,0]
	2x,x, \bar{z} [0,0,0]	\bar{x} ,2 \bar{x} , \bar{z} [0,0,0]	\bar{x} ,x, \bar{z} [0,0,0]
	2 \bar{x} , \bar{x} , \bar{z} [0,0,0]	x,2x, \bar{z} [0,0,0]	x, \bar{x} , \bar{z} [0,0,0]
12 h ..m1'	x,0,z [0,0,0]	0,x,z [0,0,0]	\bar{x} , \bar{x} ,z [0,0,0]
	\bar{x} ,0,z [0,0,0]	0, \bar{x} ,z [0,0,0]	x,x,z [0,0,0]
	0,x, \bar{z} [0,0,0]	x,0, \bar{z} [0,0,0]	\bar{x} , \bar{x} , \bar{z} [0,0,0]
	0, \bar{x} , \bar{z} [0,0,0]	\bar{x} ,0, \bar{z} [0,0,0]	x,x, \bar{z} [0,0,0]
6 g mm21'	x,2x,1/2 [0,0,0]	2 \bar{x} , \bar{x} ,1/2 [0,0,0]	x, \bar{x} ,1/2 [0,0,0]
	\bar{x} ,2 \bar{x} ,1/2 [0,0,0]	2x,x,1/2 [0,0,0]	\bar{x} ,x,1/2 [0,0,0]
6 f mm21'	x,2x,0 [0,0,0]	2 \bar{x} , \bar{x} ,0 [0,0,0]	x, \bar{x} ,0 [0,0,0]
	\bar{x} ,2 \bar{x} ,0 [0,0,0]	2x,x,0 [0,0,0]	\bar{x} ,x,0 [0,0,0]
6 e m2m1'	x,0,1/2 [0,0,0]	0,x,1/2 [0,0,0]	\bar{x} , \bar{x} ,1/2 [0,0,0]
	\bar{x} ,0,1/2 [0,0,0]	0, \bar{x} ,1/2 [0,0,0]	x,x,1/2 [0,0,0]
6 d m2m1'	x,0,0 [0,0,0]	0,x,0 [0,0,0]	\bar{x} , \bar{x} ,0 [0,0,0]
	\bar{x} ,0,0 [0,0,0]	0, \bar{x} ,0 [0,0,0]	x,x,0 [0,0,0]
2 c 6mm1'	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]	
1 b 6/mmm1'	0,0,1/2 [0,0,0]		
1 a 6/mmm1'	0,0,0 [0,0,0]		

Continued

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p6/mmm1'

Symmetry of special projections

Along [001] $6mm1'$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

Along [210] $p2mm1'$

$a^* = c$

Origin at x,x/2,0

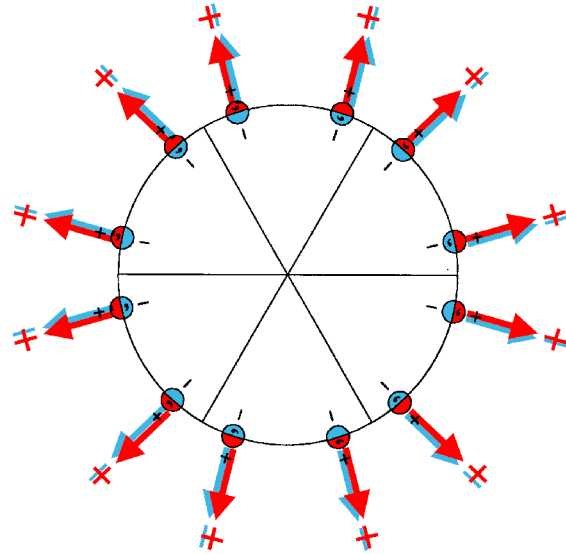
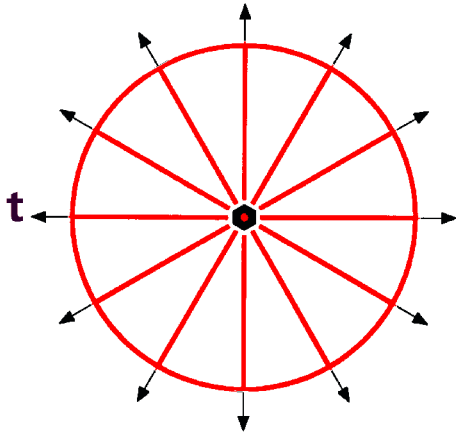
$p6/m'm'm'$

$6/m'm'm'$

Hexagonal

No. 73.3.371

$p6/m'2/m'2/m'$



Origin at center ($6/m'm'm'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x/2$

Symmetry operations

- | | | |
|--|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) m' x,x,z
(m_3 0,0,0)' | (23) m' x,0,z
(m_2 0,0,0)' | (24) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) x-y,x,z [u-v,u,w]
	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) x-y, \bar{y},\bar{z} [u-v, \bar{v},\bar{w}]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) x,x-y, \bar{z} [u,u-v, \bar{w}]
	(13) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(14) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(15) x-y,x, \bar{z} [u-v,u, \bar{w}]
	(16) x,y, \bar{z} [u,v, \bar{w}]	(17) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(19) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(20) $\bar{x}+y,y,z$ [$\bar{u}+v,v,w$]	(21) x,x-y,z [u,u-v,w]
	(22) y,x,z [v,u,w]	(23) x-y, \bar{y},z [u-v, \bar{v},w]	(24) $\bar{x},\bar{x}+y,z$ [$\bar{u},\bar{u}+v,w$]
12 k m'..	x,y,1/2 [u,v,0]	$\bar{y},x-y,1/2$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/2$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]	$y,\bar{x}+y,1/2$ [$v,\bar{u}+v,0$]	x-y,x,1/2 [u-v,v,0]
	y,x,1/2 [v,u,0]	x-y, $\bar{y},1/2$ [u-v, $\bar{v},0$]	$\bar{x},\bar{x}+y,1/2$ [$\bar{u},\bar{u}+v,0$]
	$\bar{y},\bar{x},1/2$ [$\bar{v},\bar{u},0$]	$\bar{x}+y,y,1/2$ [$\bar{u}+v,v,0$]	x,x-y,1/2 [u,u-v,0]
12 j m'..	x,y,0 [u,v,0]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$y,\bar{x}+y,0$ [$v,\bar{u}+v,0$]	x-y,x,0 [u-v,v,0]
	y,x,0 [v,u,0]	x-y, $\bar{y},0$ [u-v, $\bar{v},0$]	$\bar{x},\bar{x}+y,0$ [$\bar{u},\bar{u}+v,0$]
	$\bar{y},\bar{x},0$ [$\bar{v},\bar{u},0$]	$\bar{x}+y,y,0$ [$\bar{u}+v,v,0$]	x,x-y,0 [u,u-v,0]

Continued

No. 73.3.371

p6/m'm'm'

12 i .m'	x,2x,z [u,2u,w]	2 \bar{x} , \bar{x} ,z [2 \bar{u} , \bar{u} ,w]	x, \bar{x} ,z [u, \bar{u} ,w]
	\bar{x} ,2 \bar{x} ,z [\bar{u} ,2 \bar{u} ,w]	2x,x,z [2u,u,w]	\bar{x} ,x,z [\bar{u} ,u,w]
	2x,x, \bar{z} [2u,u, \bar{w}]	\bar{x} ,2 \bar{x} , \bar{z} [\bar{u} ,2 \bar{u} , \bar{w}]	\bar{x} ,x, \bar{z} [\bar{u} ,u, \bar{w}]
	2 \bar{x} , \bar{x} , \bar{z} [2 \bar{u} , \bar{u} , \bar{w}]	x,2x, \bar{z} [u,2u, \bar{w}]	x, \bar{x} , \bar{z} [u, \bar{u} , \bar{w}]
12 h ..m'	x,0,z [u,0,w]	0,x,z [0,u,w]	\bar{x} , \bar{x} ,z [\bar{u} , \bar{u} ,w]
	\bar{x} ,0,z [\bar{u} ,0,w]	0, \bar{x} ,z [0, \bar{u} ,w]	x,x,z [u,u,w]
	0,x, \bar{z} [0,u, \bar{w}]	x,0, \bar{z} [u,0, \bar{w}]	\bar{x} , \bar{x} , \bar{z} [\bar{u} , \bar{u} , \bar{w}]
	0, \bar{x} , \bar{z} [0, \bar{u} , \bar{w}]	\bar{x} ,0, \bar{z} [\bar{u} ,0, \bar{w}]	x,x, \bar{z} [u,u, \bar{w}]
6 g m'm'2	x,2x,1/2 [u,2u,0]	2 \bar{x} , \bar{x} ,1/2 [2 \bar{u} , \bar{u} ,0]	x, \bar{x} ,1/2 [u, \bar{u} ,0]
	\bar{x} ,2 \bar{x} ,1/2 [\bar{u} ,2 \bar{u} ,0]	2x,x,1/2 [2u,u,0]	\bar{x} ,x,1/2 [\bar{u} ,u,0]
6 f m'm'2	x,2x,0 [u,2u,0]	2 \bar{x} , \bar{x} ,0 [2 \bar{u} , \bar{u} ,0]	x, \bar{x} ,0 [u, \bar{u} ,0]
	\bar{x} ,2 \bar{x} ,0 [\bar{u} ,2 \bar{u} ,0]	2x,x,0 [2u,u,0]	\bar{x} ,x,0 [\bar{u} ,u,0]
6 e m'2m'	x,0,1/2 [u,0,0]	0,x,1/2 [0,u,0]	\bar{x} , \bar{x} ,1/2 [\bar{u} , \bar{u} ,0]
	\bar{x} ,0,1/2 [\bar{u} ,0,0]	0, \bar{x} ,1/2 [0, \bar{u} ,0]	x,x,1/2 [u,u,0]
6 d m'2m'	x,0,0 [u,0,0]	0,x,0 [0,u,0]	\bar{x} , \bar{x} ,0 [\bar{u} , \bar{u} ,0]
	\bar{x} ,0,0 [\bar{u} ,0,0]	0, \bar{x} ,0 [0, \bar{u} ,0]	x,x,0 [u,u,0]
2 c 6m'm'	0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]	
1 b 6/m'm'm'	0,0,1/2 [0,0,0]		
1 a 6/m'm'm'	0,0,0 [0,0,0]		

Continued

No. 73.3.371

$p6/m'm'm'$

Symmetry of special projections

Along [001] $6mm1'$

Origin at 0,0,z

Along [100] $p2m'm'$

$a^* = c$

Origin at x,0,0

Along [210] $p2m'm'$

$a^* = c$

Origin at x,x/2,0

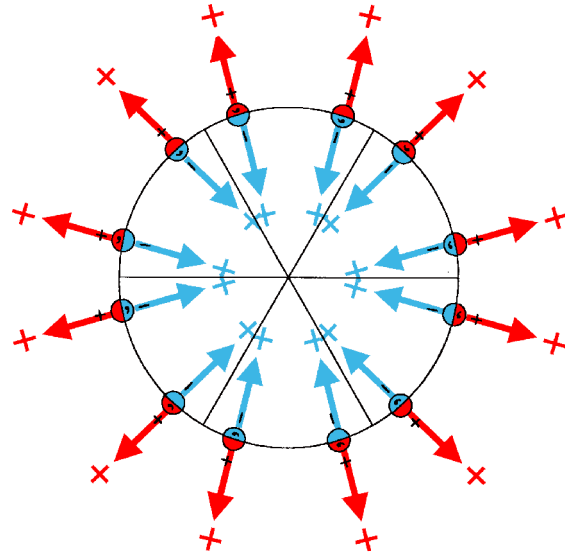
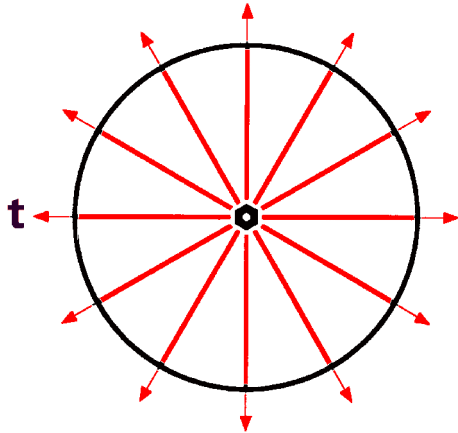
$p6/mm'm'$

$6/mm'm'$

Hexagonal

No. 73.4.372

$p6/m2'/m'2'/m'$



Origin at center ($6/mm'm'$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x/2$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) m' x,x,z
(m_3 0,0,0)' | (23) m' x,0,z
(m_2 0,0,0)' | (24) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) x-y,x,z [u-v,u,w]
	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) x-y, \bar{y},\bar{z} [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [u,u-v,w]
	(10) \bar{y},\bar{x},\bar{z} [v,u,w]	(11) $\bar{x}+y,y,\bar{z}$ [u-v, \bar{v},w]	(12) x,x-y, \bar{z} [$\bar{u},\bar{u}+v,w$]
	(13) \bar{x},\bar{y},\bar{z} [u,v,w]	(14) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(15) x-y,x, \bar{z} [$\bar{u}+v,\bar{u},w$]
	(16) x,y, \bar{z} [\bar{u},\bar{v},w]	(17) $\bar{y},x-y,\bar{z}$ [v, $\bar{u}+v,w$]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [u-v,u,w]
	(19) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(20) $\bar{x}+y,y,z$ [$\bar{u}+v,v,w$]	(21) x,x-y,z [u,u-v,w]
	(22) y,x,z [v,u,w]	(23) x-y, \bar{y},z [u-v, \bar{v},w]	(24) $\bar{x},\bar{x}+y,z$ [$\bar{u},\bar{u}+v,w$]
12 k m..	x,y,1/2 [0,0,w]	$\bar{y},x-y,1/2$ [0,0,w]	$\bar{x}+y,\bar{x},1/2$ [0,0,w]
	$\bar{x},\bar{y},1/2$ [0,0,w]	y, $\bar{x}+y,1/2$ [0,0,w]	x-y,x,1/2 [0,0,w]
	y,x,1/2 [0,0,w]	x-y, $\bar{y},1/2$ [0,0,w]	$\bar{x},\bar{x}+y,1/2$ [0,0,w]
	$\bar{y},\bar{x},1/2$ [0,0,w]	$\bar{x}+y,y,1/2$ [0,0,w]	x,x-y,1/2 [0,0,w]
12 j m..	x,y,0 [0,0,w]	$\bar{y},x-y,0$ [0,0,w]	$\bar{x}+y,\bar{x},0$ [0,0,w]
	$\bar{x},\bar{y},0$ [0,0,w]	y, $\bar{x}+y,0$ [0,0,w]	x-y,x,0 [0,0,w]
	y,x,0 [0,0,w]	x-y, $\bar{y},0$ [0,0,w]	$\bar{x},\bar{x}+y,0$ [0,0,w]
	$\bar{y},\bar{x},0$ [0,0,w]	$\bar{x}+y,y,0$ [0,0,w]	x,x-y,0 [0,0,w]

Continued		No. 73.4.372	$\rho_6/mm'm'$
12 i .m'	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$	$x,\bar{x},z [u,\bar{u},w]$
	$\bar{x},2\bar{x},z [\bar{u},2\bar{u},w]$	$2x,x,z [2u,u,w]$	$\bar{x},x,z [\bar{u},u,w]$
	$2x,x,\bar{z} [2\bar{u},\bar{u},w]$	$\bar{x},2\bar{x},\bar{z} [u,2u,w]$	$\bar{x},x,\bar{z} [u,\bar{u},w]$
	$2\bar{x},\bar{x},\bar{z} [2u,u,w]$	$x,2x,\bar{z} [\bar{u},2\bar{u},w]$	$x,\bar{x},\bar{z} [\bar{u},u,w]$
12 h ..m'	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
	$\bar{x},0,z [\bar{u},0,w]$	$0,\bar{x},z [0,\bar{u},w]$	$x,x,z [u,u,w]$
	$0,x,\bar{z} [0,\bar{u},w]$	$x,0,\bar{z} [\bar{u},0,w]$	$\bar{x},\bar{x},\bar{z} [u,u,w]$
	$0,\bar{x},\bar{z} [0,u,w]$	$\bar{x},0,\bar{z} [u,0,w]$	$x,x,\bar{z} [\bar{u},\bar{u},w]$
6 g mm'2'	$x,2x,1/2 [0,0,w]$	$2\bar{x},\bar{x},1/2 [0,0,w]$	$x,\bar{x},1/2 [0,0,w]$
	$\bar{x},2\bar{x},1/2 [0,0,w]$	$2x,x,1/2 [0,0,w]$	$\bar{x},x,1/2 [0,0,w]$
6 f mm'2'	$x,2x,0 [0,0,w]$	$2\bar{x},\bar{x},0 [0,0,w]$	$x,\bar{x},0 [0,0,w]$
	$\bar{x},2\bar{x},0 [0,0,w]$	$2x,x,0 [0,0,w]$	$\bar{x},x,0 [0,0,w]$
6 e m2'm'	$x,0,1/2 [0,0,w]$	$0,x,1/2 [0,0,w]$	$\bar{x},\bar{x},1/2 [0,0,w]$
	$\bar{x},0,1/2 [0,0,w]$	$0,\bar{x},1/2 [0,0,w]$	$x,x,1/2 [0,0,w]$
6 d m2'm'	$x,0,0 [0,0,w]$	$0,x,0 [0,0,w]$	$\bar{x},\bar{x},0 [0,0,w]$
	$\bar{x},0,0 [0,0,w]$	$0,\bar{x},0 [0,0,w]$	$x,x,0 [0,0,w]$
2 c 6m'm'	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$	
1 b 6/mm'm'	$0,0,1/2 [0,0,w]$		
1 a 6/mm'm'	$0,0,0 [0,0,w]$		

Continued

No. 73.4.372

$p6/mm'm'$

Symmetry of special projections

Along $[001]$ $6m'm'$

Origin at $0,0,z$

Along $[100]$ $p2'mm'$

$a^* = c$

Origin at $x,0,0$

Along $[210]$ $p2'mm'$

$a^* = c$

Origin at $x,x/2,0$

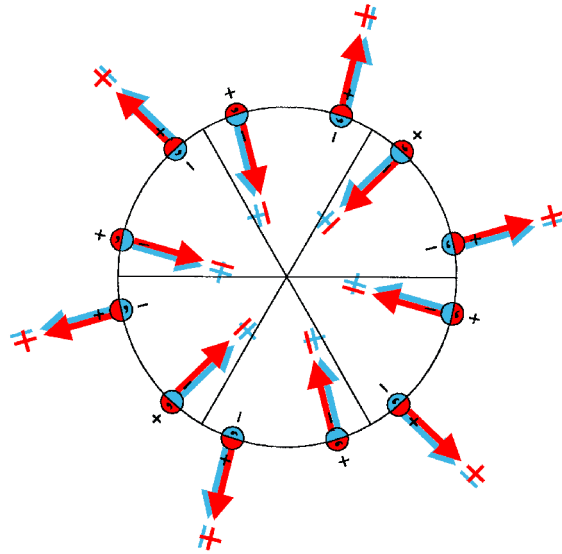
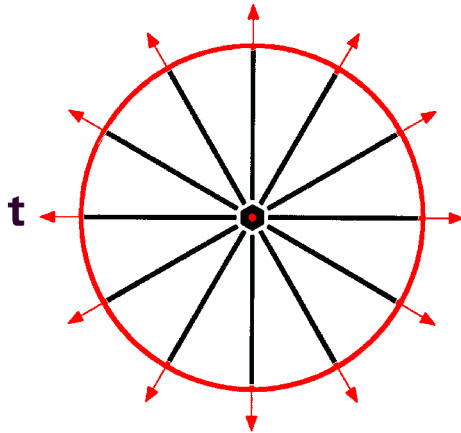
$p6/m'mm$

$6/m'mm$

Hexagonal

No. 73.5.373

$p6/m'2/m2'/m$



Origin at center ($6/m'mm$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq 1/2; y \leq x/2$

Symmetry operations

- | | | |
|---|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) m x,x,z
(m_3 0,0,0) | (23) m x,0,z
(m_2 0,0,0) | (24) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) x-y,x,z [u-v,u,w]
	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) x-y, \bar{y},\bar{z} [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [u,u-v,w]
	(10) \bar{y},\bar{x},\bar{z} [v,u,w]	(11) $\bar{x}+y,y,\bar{z}$ [u-v, \bar{v},w]	(12) x,x-y, \bar{z} [$\bar{u},\bar{u}+v,w$]
	(13) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(14) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(15) x-y,x, \bar{z} [u-v,u, \bar{w}]
	(16) x,y, \bar{z} [u,v, \bar{w}]	(17) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(19) \bar{y},\bar{x},z [v,u, \bar{w}]	(20) $\bar{x}+y,y,z$ [u-v, \bar{v},\bar{w}]	(21) x,x-y,z [$\bar{u},\bar{u}+v,\bar{w}$]
	(22) y,x,z [\bar{v},\bar{u},\bar{w}]	(23) x-y, \bar{y},z [$\bar{u}+v,v,\bar{w}$]	(24) $\bar{x},\bar{x}+y,z$ [u,u-v, \bar{w}]
12 k m'..	x,y,1/2 [u,v,0]	$\bar{y},x-y,1/2$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/2$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},1/2$ [$\bar{u},\bar{v},0$]	$y,\bar{x}+y,1/2$ [v, $\bar{u}+v,0$]	x-y,x,1/2 [u-v,u,0]
	y,x,1/2 [$\bar{v},\bar{u},0$]	x-y, $\bar{y},1/2$ [$\bar{u}+v,v,0$]	$\bar{x},\bar{x}+y,1/2$ [u,u-v,0]
	$\bar{y},\bar{x},1/2$ [v,u,0]	$\bar{x}+y,y,1/2$ [u-v, $\bar{v},0$]	x,x-y,1/2 [$\bar{u},\bar{u}+v,0$]
12 j m'..	x,y,0 [u,v,0]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$y,\bar{x}+y,0$ [v, $\bar{u}+v,0$]	x-y,x,0 [u-v,u,0]
	y,x,0 [$\bar{v},\bar{u},0$]	x-y, $\bar{y},0$ [$\bar{u}+v,v,0$]	$\bar{x},\bar{x}+y,0$ [u,u-v,0]
	$\bar{y},\bar{x},0$ [v,u,0]	$\bar{x}+y,y,0$ [u-v, $\bar{v},0$]	x,x-y,0 [$\bar{u},\bar{u}+v,0$]

Continued

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 $p6/m'mm$

12 i .m.	$x, 2x, z [u, 0, 0]$	$2\bar{x}, \bar{x}, z [0, u, 0]$	$x, \bar{x}, z [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 2\bar{x}, z [\bar{u}, 0, 0]$	$2x, x, z [0, \bar{u}, 0]$	$\bar{x}, x, z [u, u, 0]$
	$2x, x, \bar{z} [0, \bar{u}, 0]$	$\bar{x}, 2\bar{x}, \bar{z} [\bar{u}, 0, 0]$	$\bar{x}, x, \bar{z} [u, u, 0]$
	$2\bar{x}, \bar{x}, \bar{z} [0, u, 0]$	$x, 2x, \bar{z} [u, 0, 0]$	$x, \bar{x}, \bar{z} [\bar{u}, \bar{u}, 0]$
12 h ..m	$x, 0, z [u, 2u, 0]$	$0, x, z [2\bar{u}, \bar{u}, 0]$	$\bar{x}, \bar{x}, z [u, \bar{u}, 0]$
	$\bar{x}, 0, z [\bar{u}, 2\bar{u}, 0]$	$0, \bar{x}, z [2u, u, 0]$	$x, x, z [\bar{u}, u, 0]$
	$0, x, \bar{z} [2\bar{u}, \bar{u}, 0]$	$x, 0, \bar{z} [u, 2u, 0]$	$\bar{x}, \bar{x}, \bar{z} [u, \bar{u}, 0]$
	$0, \bar{x}, \bar{z} [2u, u, 0]$	$\bar{x}, 0, \bar{z} [\bar{u}, 2\bar{u}, 0]$	$x, x, \bar{z} [\bar{u}, u, 0]$
6 g m'm2'	$x, 2x, 1/2 [u, 0, 0]$	$2\bar{x}, \bar{x}, 1/2 [0, u, 0]$	$x, \bar{x}, 1/2 [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 2\bar{x}, 1/2 [\bar{u}, 0, 0]$	$2x, x, 1/2 [0, \bar{u}, 0]$	$\bar{x}, x, 1/2 [u, u, 0]$
6 f m'm2'	$x, 2x, 0 [u, 0, 0]$	$2\bar{x}, \bar{x}, 0 [0, u, 0]$	$x, \bar{x}, 0 [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 2\bar{x}, 0 [\bar{u}, 0, 0]$	$2x, x, 0 [0, \bar{u}, 0]$	$\bar{x}, x, 0 [u, u, 0]$
6 e m'2'm	$x, 0, 1/2 [u, 2u, 0]$	$0, x, 1/2 [2\bar{u}, \bar{u}, 0]$	$\bar{x}, \bar{x}, 1/2 [u, \bar{u}, 0]$
	$\bar{x}, 0, 1/2 [\bar{u}, 2\bar{u}, 0]$	$0, \bar{x}, 1/2 [2u, u, 0]$	$x, x, 1/2 [\bar{u}, u, 0]$
6 d m'2'm	$x, 0, 0 [u, 2u, 0]$	$0, x, 0 [2\bar{u}, \bar{u}, 0]$	$\bar{x}, \bar{x}, 0 [u, \bar{u}, 0]$
	$\bar{x}, 0, 0 [\bar{u}, 2\bar{u}, 0]$	$0, \bar{x}, 0 [2u, u, 0]$	$x, x, 0 [\bar{u}, u, 0]$
2 c 6mm	$0, 0, z [0, 0, 0]$	$0, 0, \bar{z} [0, 0, 0]$	
1 b 6/m'mm	$0, 0, 1/2 [0, 0, 0]$		
1 a 6/m'mm	$0, 0, 0 [0, 0, 0]$		

Continued

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$p6/m'mm$

Symmetry of special projections

Along $[001]$ $6mm1'$

Origin at $0,0,z$

Along $[100]$ $p2mm1'$

$a^* = c$

Origin at $x,0,0$

Along $[210]$ $p2mm1'$

$a^* = c$

Origin at $x,x/2,0$

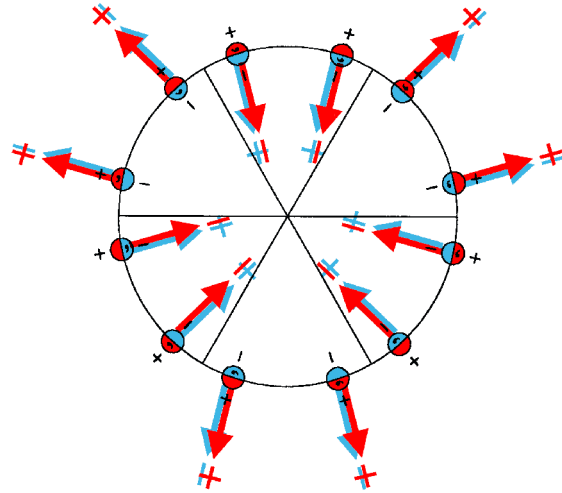
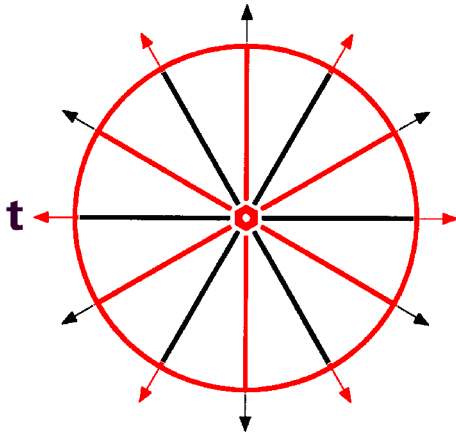
$p6'/m'm'm$

$6'/m'm'm$

Hexagonal

No. 73.6.374

$p6'/m'2'/m'2'/m$



Origin at center ($6'/m'm'm$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x/2$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) m x,x,z
(m_3 0,0,0) | (23) m x,0,z
(m_2 0,0,0) | (24) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v, \bar{w}]	(5) $y,\bar{x}+y,z$ [$\bar{v},u-v,\bar{w}$]	(6) x-y,x,z [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) x-y, \bar{y},\bar{z} [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [u,u-v,w]
	(10) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) x,x-y, \bar{z} [u,u-v, \bar{w}]
	(13) \bar{x},\bar{y},\bar{z} [u,v,w]	(14) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(15) x-y,x, \bar{z} [$\bar{u}+v,\bar{u},w$]
	(16) x,y, \bar{z} [u,v, \bar{w}]	(17) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(19) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(20) $\bar{x}+y,y,z$ [$\bar{u}+v,v,w$]	(21) x,x-y,z [u,u-v,w]
	(22) y,x,z [\bar{v},\bar{u},\bar{w}]	(23) x-y, \bar{y},z [$\bar{u}+v,v,\bar{w}$]	(24) $\bar{x},\bar{x}+y,z$ [u,u-v, \bar{w}]
12 k m'..	x,y,1/2 [u,v,0]	$\bar{y},x-y,1/2$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/2$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},1/2$ [u,v,0]	$y,\bar{x}+y,1/2$ [$\bar{v},u-v,0$]	x-y,x,1/2 [$\bar{u}+v,\bar{u},0$]
	y,x,1/2 [$\bar{v},\bar{u},0$]	x-y, $\bar{y},1/2$ [$\bar{u}+v,v,0$]	$\bar{x},\bar{x}+y,1/2$ [u,u-v,0]
	$\bar{y},\bar{x},1/2$ [$\bar{v},\bar{u},0$]	$\bar{x}+y,y,1/2$ [$\bar{u}+v,v,0$]	x,x-y,1/2 [u,u-v,0]
12 j m'..	x,y,0 [u,v,0]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},0$ [u,v,0]	$y,\bar{x}+y,0$ [$\bar{v},u-v,0$]	x-y,x,0 [$\bar{u}+v,\bar{u},0$]
	y,x,0 [$\bar{v},\bar{u},0$]	x-y, $\bar{y},0$ [$\bar{u}+v,v,0$]	$\bar{x},\bar{x}+y,0$ [u,u-v,0]
	$\bar{y},\bar{x},0$ [$\bar{v},\bar{u},0$]	$\bar{x}+y,y,0$ [$\bar{u}+v,v,0$]	x,x-y,0 [u,u-v,0]

Continued

No. 73.6.374

p6'/m'm'm

12 i .m'	x,2x,z [u,2u,w]	2 \bar{x} , \bar{x} ,z [2 \bar{u} , \bar{u} ,w]	x, \bar{x} ,z [u, \bar{u} ,w]
	\bar{x} ,2 \bar{x} ,z [u,2u, \bar{w}]	2x,x,z [2 \bar{u} , \bar{u} , \bar{w}]	\bar{x} ,x,z [u, \bar{u} , \bar{w}]
	2x,x, \bar{z} [2 \bar{u} , \bar{u} ,w]	\bar{x} ,2 \bar{x} , \bar{z} [u,2u,w]	\bar{x} ,x, \bar{z} [u, \bar{u} ,w]
	2 \bar{x} , \bar{x} , \bar{z} [2 \bar{u} , \bar{u} , \bar{w}]	x,2x, \bar{z} [u,2u, \bar{w}]	x, \bar{x} , \bar{z} [u, \bar{u} , \bar{w}]
12 h ..m	x,0,z [u,2u,0]	0,x,z [2 \bar{u} , \bar{u} ,0]	\bar{x} , \bar{x} ,z [u, \bar{u} ,0]
	\bar{x} ,0,z [u,2u,0]	0, \bar{x} ,z [2 \bar{u} , \bar{u} ,0]	x,x,z [u, \bar{u} ,0]
	0,x, \bar{z} [2 \bar{u} , \bar{u} ,0]	x,0, \bar{z} [u,2u,0]	\bar{x} , \bar{x} , \bar{z} [u, \bar{u} ,0]
	0, \bar{x} , \bar{z} [2 \bar{u} , \bar{u} ,0]	\bar{x} ,0, \bar{z} [u,2u,0]	x,x, \bar{z} [u, \bar{u} ,0]
6 g m'm'2	x,2x,1/2 [u,2u,0]	2 \bar{x} , \bar{x} ,1/2 [2 \bar{u} , \bar{u} ,0]	x, \bar{x} ,1/2 [u, \bar{u} ,0]
	\bar{x} ,2 \bar{x} ,1/2 [u,2u,0]	2x,x,1/2 [2 \bar{u} , \bar{u} ,0]	\bar{x} ,x,1/2 [u, \bar{u} ,0]
6 f m'm'2	x,2x,0 [u,2u,0]	2 \bar{x} , \bar{x} ,0 [2 \bar{u} , \bar{u} ,0]	x, \bar{x} ,0 [u, \bar{u} ,0]
	\bar{x} ,2 \bar{x} ,0 [u,2u,0]	2x,x,0 [2 \bar{u} , \bar{u} ,0]	\bar{x} ,x,0 [u, \bar{u} ,0]
6 e m'2'm	x,0,1/2 [u,2u,0]	0,x,1/2 [2 \bar{u} , \bar{u} ,0]	\bar{x} , \bar{x} ,1/2 [u, \bar{u} ,0]
	\bar{x} ,0,1/2 [u,2u,0]	0, \bar{x} ,1/2 [2 \bar{u} , \bar{u} ,0]	x,x,1/2 [u, \bar{u} ,0]
6 d m'2'm	x,0,0 [u,2u,0]	0,x,0 [2 \bar{u} , \bar{u} ,0]	\bar{x} , \bar{x} ,0 [u, \bar{u} ,0]
	\bar{x} ,0,0 [u,2u,0]	0, \bar{x} ,0 [2 \bar{u} , \bar{u} ,0]	x,x,0 [u, \bar{u} ,0]
2 c 6'm'm	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]	
1 b 6'/m'm'm	0,0,1/2 [0,0,0]		
1 a 6'/m'm'm	0,0,0 [0,0,0]		

Continued

No. 73.6.374

$p6'/m'm'm$

Symmetry of special projections

Along [001] $6mm1'$

Origin at 0,0,z

Along [100] $p2'm'm$

$a^* = c$

Origin at x,0,0

Along [210] $p2mm1'$

$a^* = c$

Origin at x,x/2,0

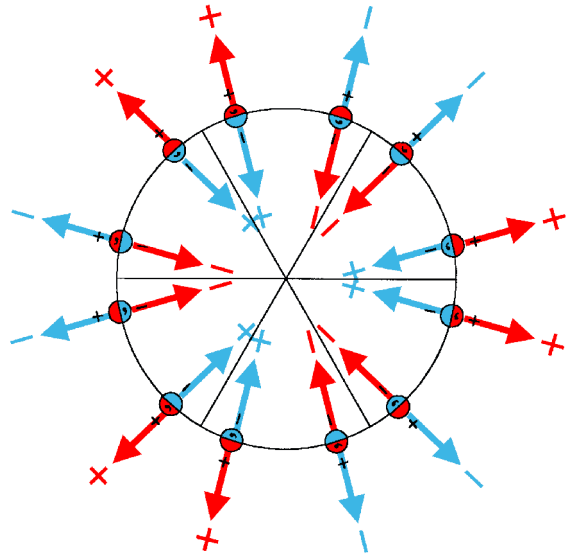
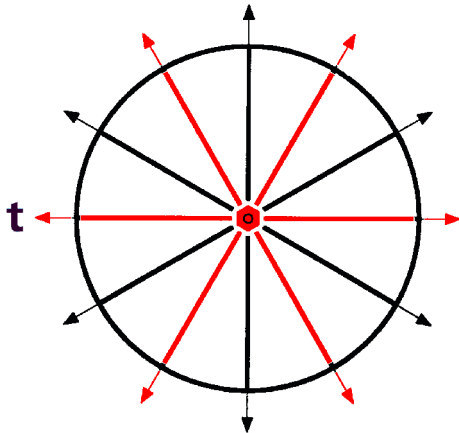
$p6'/mmm'$

$6'/mmm'$

Hexagonal

No. 73.7.375

$p6'/m2'/m2'/m'$



Origin at center ($6'/mmm'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x/2$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) m' x,x,z
(m_3 0,0,0)' | (23) m' x,0,z
(m_2 0,0,0)' | (24) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v, \bar{w}]	(5) $y,\bar{x}+y,z$ [$\bar{v},u-v,\bar{w}$]	(6) x-y,x,z [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) x-y, \bar{y},\bar{z} [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [u,u-v,w]
	(10) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(12) x,x-y, \bar{z} [u,u-v, \bar{w}]
	(13) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(14) $y,\bar{x}+y,\bar{z}$ [v, $\bar{u}+v,\bar{w}$]	(15) x-y,x, \bar{z} [u-v,u, \bar{w}]
	(16) x,y, \bar{z} [\bar{u},\bar{v},w]	(17) $\bar{y},x-y,\bar{z}$ [v, $\bar{u}+v,w$]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [u-v,u,w]
	(19) \bar{y},\bar{x},z [v,u, \bar{w}]	(20) $\bar{x}+y,y,z$ [u-v, \bar{v},\bar{w}]	(21) x,x-y,z [$\bar{u},\bar{u}+v,\bar{w}$]
	(22) y,x,z [v,u,w]	(23) x-y, \bar{y},z [u-v, \bar{v},w]	(24) $\bar{x},\bar{x}+y,z$ [$\bar{u},\bar{u}+v,w$]
12 k m..	x,y,1/2 [0,0,w]	$\bar{y},x-y,1/2$ [0,0,w]	$\bar{x}+y,\bar{x},1/2$ [0,0,w]
	$\bar{x},\bar{y},1/2$ [0,0, \bar{w}]	$y,\bar{x}+y,1/2$ [0,0, \bar{w}]	x-y,x,1/2 [0,0, \bar{w}]
	y,x,1/2 [0,0,w]	x-y, $\bar{y},1/2$ [0,0,w]	$\bar{x},\bar{x}+y,1/2$ [0,0,w]
	$\bar{y},\bar{x},1/2$ [0,0, \bar{w}]	$\bar{x}+y,y,1/2$ [0,0, \bar{w}]	x,x-y,1/2 [0,0, \bar{w}]
12 j m..	x,y,0 [0,0,w]	$\bar{y},x-y,0$ [0,0,w]	$\bar{x}+y,\bar{x},0$ [0,0,w]
	$\bar{x},\bar{y},0$ [0,0, \bar{w}]	$y,\bar{x}+y,0$ [0,0, \bar{w}]	x-y,x,0 [0,0, \bar{w}]
	y,x,0 [0,0,w]	x-y, $\bar{y},0$ [0,0,w]	$\bar{x},\bar{x}+y,0$ [0,0,w]
	$\bar{y},\bar{x},0$ [0,0, \bar{w}]	$\bar{x}+y,y,0$ [0,0, \bar{w}]	x,x-y,0 [0,0, \bar{w}]

Continued		No. 73.7.375	$p6'/mmm'$
12 i .m.	$x, 2x, z [u, 0, 0]$	$2\bar{x}, \bar{x}, z [0, u, 0]$	$x, \bar{x}, z [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 2\bar{x}, z [u, 0, 0]$	$2x, x, z [0, u, 0]$	$\bar{x}, x, z [\bar{u}, \bar{u}, 0]$
	$2x, x, \bar{z} [0, \bar{u}, 0]$	$\bar{x}, 2\bar{x}, \bar{z} [\bar{u}, 0, 0]$	$\bar{x}, x, \bar{z} [u, u, 0]$
	$2\bar{x}, \bar{x}, \bar{z} [0, \bar{u}, 0]$	$x, 2x, \bar{z} [\bar{u}, 0, 0]$	$x, \bar{x}, \bar{z} [u, u, 0]$
12 h ..m'	$x, 0, z [u, 0, w]$	$0, x, z [0, u, w]$	$\bar{x}, \bar{x}, z [\bar{u}, \bar{u}, w]$
	$\bar{x}, 0, z [u, 0, \bar{w}]$	$0, \bar{x}, z [0, u, \bar{w}]$	$x, x, z [\bar{u}, \bar{u}, \bar{w}]$
	$0, x, \bar{z} [0, \bar{u}, w]$	$x, 0, \bar{z} [\bar{u}, 0, w]$	$\bar{x}, \bar{x}, \bar{z} [u, u, w]$
	$0, \bar{x}, \bar{z} [0, \bar{u}, \bar{w}]$	$\bar{x}, 0, \bar{z} [\bar{u}, 0, \bar{w}]$	$x, x, \bar{z} [u, u, \bar{w}]$
6 g mm2	$x, 2x, 1/2 [0, 0, 0]$	$2\bar{x}, \bar{x}, 1/2 [0, 0, 0]$	$x, \bar{x}, 1/2 [0, 0, 0]$
	$\bar{x}, 2\bar{x}, 1/2 [0, 0, 0]$	$2x, x, 1/2 [0, 0, 0]$	$\bar{x}, x, 1/2 [0, 0, 0]$
6 f mm2	$x, 2x, 0 [0, 0, 0]$	$2\bar{x}, \bar{x}, 0 [0, 0, 0]$	$x, \bar{x}, 0 [0, 0, 0]$
	$\bar{x}, 2\bar{x}, 0 [0, 0, 0]$	$2x, x, 0 [0, 0, 0]$	$\bar{x}, x, 0 [0, 0, 0]$
6 e m2'm'	$x, 0, 1/2 [0, 0, w]$	$0, x, 1/2 [0, 0, w]$	$\bar{x}, \bar{x}, 1/2 [0, 0, w]$
	$\bar{x}, 0, 1/2 [0, 0, \bar{w}]$	$0, \bar{x}, 1/2 [0, 0, \bar{w}]$	$x, x, 1/2 [0, 0, \bar{w}]$
6 d m2'm'	$x, 0, 0 [0, 0, w]$	$0, x, 0 [0, 0, w]$	$\bar{x}, \bar{x}, 0 [0, 0, w]$
	$\bar{x}, 0, 0 [0, 0, \bar{w}]$	$0, \bar{x}, 0 [0, 0, \bar{w}]$	$x, x, 0 [0, 0, \bar{w}]$
2 c 6'mm'	$0, 0, z [0, 0, 0]$	$0, 0, \bar{z} [0, 0, 0]$	
1 b 6'/mmm'	$0, 0, 1/2 [0, 0, 0]$		
1 a 6'/mmm'	$0, 0, 0 [0, 0, 0]$		

Continued

No. 73.7.375

$p6'/mmm'$

Symmetry of special projections

Along $[001]$ $6'mm'$

Origin at $0,0,z$

Along $[100]$ $p2mm1'$

$a^* = c$

Origin at $x,0,0$

Along $[210]$ $p2mm$

$a^* = c$

Origin at $x,x/2,0$

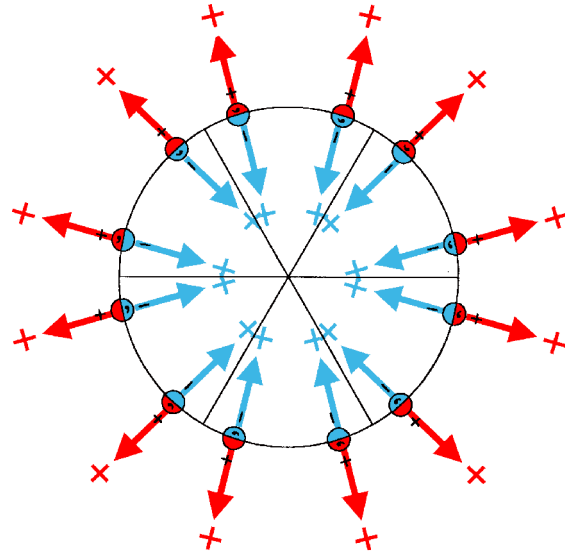
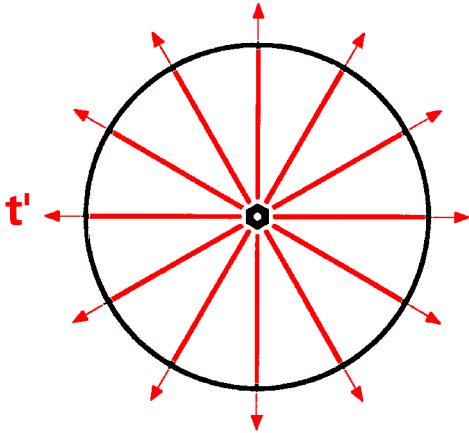
$\rho_{2c} 6/mm'm'$

$6/mmm1'$

Hexagonal

No. 73.8.376

$\rho_{2c} 6/mm'm'$



Origin at center ($6/mm'm'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x/2$

Symmetry operations

For (0,0,0) + set

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) m' x,x,z
(m_3 0,0,0)' | (23) m' x,0,z
(m_2 0,0,0)' | (24) m' 0,y,z
(m_1 0,0,0)' |

For $(0,0,1)'$ + set

$$(1) t' (0,0,1) \\ (1|0,0,1)'$$

$$(4) 2' (0,0,1) \quad 0,0,z \\ (2_z|0,0,1)'$$

$$(7) 2 \quad x,x,1/2 \\ (2_{xy}|0,0,1)$$

$$(10) 2 \quad x,\bar{x},1/2 \\ (2_3|0,0,1)$$

$$(13) \bar{1}' \quad 0,0,1/2 \\ (\bar{1}|0,0,1)'$$

$$(16) m' \quad x,y,1/2 \\ (m_z|0,0,1)'$$

$$(19) c (0,0,1) \quad x,\bar{x},z \\ (m_{xy}|0,0,1)$$

$$(22) c (0,0,1) \quad x,x,z \\ (m_3|0,0,1)$$

$$(2) 3^{+'} (0,0,1) \quad 0,0,z \\ (3_z|0,0,1)'$$

$$(5) 6^{-'} (0,0,1) \quad 0,0,z \\ (6_z^{-1}|0,0,1)'$$

$$(8) 2 \quad x,0,1/2 \\ (2_x|0,0,1)$$

$$(11) 2 \quad x,2x,1/2 \\ (2_2|0,0,1)$$

$$(14) \bar{3}^{+'} \quad 0,0,z; 0,0,1/2 \\ (\bar{3}_z|0,0,1)'$$

$$(17) \bar{6}^{-'} \quad 0,0,z; 0,0,1/2 \\ (\bar{6}_z^{-1}|0,0,1)'$$

$$(20) c (0,0,1) \quad x,2x,z \\ (m_x|0,0,1)$$

$$(23) c (0,0,1) \quad x,0,z \\ (m_2|0,0,1)$$

$$(3) 3^{-'} (0,0,1) \quad 0,0,z \\ (3_z^{-1}|0,0,1)'$$

$$(6) 6^{+'} (0,0,1) \quad 0,0,z \\ (6_z|0,0,1)'$$

$$(9) 2 \quad 0,y,1/2 \\ (2_y|0,0,1)$$

$$(12) 2 \quad 2x,x,1/2 \\ (2_1|0,0,1)$$

$$(15) \bar{3}^{-'} \quad 0,0,z; 0,0,1/2 \\ (\bar{3}_z^{-1}|0,0,1)'$$

$$(18) \bar{6}^{+'} \quad 0,0,z; 0,0,1/2 \\ (\bar{6}_z|0,0,1)'$$

$$(21) c (0,0,1) \quad 2x,x,z \\ (m_y|0,0,1)$$

$$(24) c (0,0,1) \quad 0,y,z \\ (m_1|0,0,1)$$

Generators selected (1); $t(0,0,1)'$; (2); (4); (7); (13)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
24 l 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z [v,\bar{u}+v,w]$	(6) $x-y,x,z [u-v,u,w]$
	(7) $y,x,\bar{z} [\bar{v},\bar{u},w]$	(8) $x-y,\bar{y},\bar{z} [\bar{u}+v,v,w]$	(9) $\bar{x},\bar{x}+y,\bar{z} [u,u-v,w]$
	(10) $\bar{y},\bar{x},\bar{z} [v,u,w]$	(11) $\bar{x}+y,y,\bar{z} [u-v,\bar{v},w]$	(12) $x,x-y,\bar{z} [\bar{u},\bar{u}+v,w]$
	(13) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(14) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$	(15) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$
	(16) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(17) $\bar{y},x-y,\bar{z} [v,\bar{u}+v,w]$	(18) $\bar{x}+y,\bar{x},\bar{z} [u-v,u,w]$
	(19) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(20) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(21) $x,x-y,z [u,u-v,w]$
	(22) $y,x,z [v,u,w]$	(23) $x-y,\bar{y},z [u-v,\bar{v},w]$	(24) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$
12 k $m'\bar{..}$	$x,y,1/2 [u,v,0]$	$\bar{y},x-y,1/2 [\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},1/2 [\bar{u}+v,\bar{u},0]$
	$\bar{x},\bar{y},1/2 [\bar{u},\bar{v},0]$	$y,\bar{x}+y,1/2 [v,\bar{u}+v,0]$	$x-y,x,1/2 [u-v,u,0]$
	$y,x,1/2 [\bar{v},\bar{u},0]$	$x-y,\bar{y},1/2 [\bar{u}+v,v,0]$	$\bar{x},\bar{x}+y,1/2 [u,u-v,0]$
	$\bar{y},\bar{x},1/2 [v,u,0]$	$\bar{x}+y,y,1/2 [u-v,\bar{v},0]$	$x,x-y,1/2 [\bar{u},\bar{u}+v,0]$
12 j $m\bar{..}$	$x,y,0 [0,0,w]$	$\bar{y},x-y,0 [0,0,w]$	$\bar{x}+y,\bar{x},0 [0,0,w]$
	$\bar{x},\bar{y},0 [0,0,w]$	$y,\bar{x}+y,0 [0,0,w]$	$x-y,x,0 [0,0,w]$
	$y,x,0 [0,0,w]$	$x-y,\bar{y},0 [0,0,w]$	$\bar{x},\bar{x}+y,0 [0,0,w]$
	$\bar{y},\bar{x},0 [0,0,w]$	$\bar{x}+y,y,0 [0,0,w]$	$x,x-y,0 [0,0,w]$

Continued

No. 73.8.376

 $p_{2c} 6/mm'm'$

12 i .m'	$x, 2x, z [u, 2u, w]$	$2\bar{x}, \bar{x}, z [2\bar{u}, \bar{u}, w]$	$x, \bar{x}, z [u, \bar{u}, w]$
	$\bar{x}, 2\bar{x}, z [\bar{u}, 2\bar{u}, w]$	$2x, x, z [2u, u, w]$	$\bar{x}, x, z [\bar{u}, u, w]$
	$2x, x, \bar{z} [2\bar{u}, \bar{u}, w]$	$\bar{x}, 2\bar{x}, \bar{z} [u, 2u, w]$	$\bar{x}, x, \bar{z} [u, \bar{u}, w]$
	$2\bar{x}, \bar{x}, \bar{z} [2u, u, w]$	$x, 2x, \bar{z} [\bar{u}, 2\bar{u}, w]$	$x, \bar{x}, \bar{z} [\bar{u}, u, w]$
12 h ..m'	$x, 0, z [u, 0, w]$	$0, x, z [0, u, w]$	$\bar{x}, \bar{x}, z [\bar{u}, \bar{u}, w]$
	$\bar{x}, 0, z [\bar{u}, 0, w]$	$0, \bar{x}, z [0, \bar{u}, w]$	$x, x, z [u, u, w]$
	$0, x, \bar{z} [0, \bar{u}, w]$	$x, 0, \bar{z} [\bar{u}, 0, w]$	$\bar{x}, \bar{x}, \bar{z} [u, u, w]$
	$0, \bar{x}, \bar{z} [0, u, w]$	$\bar{x}, 0, \bar{z} [u, 0, w]$	$x, x, \bar{z} [\bar{u}, \bar{u}, w]$
6 g m'm'2	$x, 2x, 1/2 [u, 2u, 0]$	$2\bar{x}, \bar{x}, 1/2 [2\bar{u}, \bar{u}, 0]$	$x, \bar{x}, 1/2 [u, \bar{u}, 0]$
	$\bar{x}, 2\bar{x}, 1/2 [\bar{u}, 2\bar{u}, 0]$	$2x, x, 1/2 [2u, u, 0]$	$\bar{x}, x, 1/2 [\bar{u}, u, 0]$
6 f mm'2'	$x, 2x, 0 [0, 0, w]$	$2\bar{x}, \bar{x}, 0 [0, 0, w]$	$x, \bar{x}, 0 [0, 0, w]$
	$\bar{x}, 2\bar{x}, 0 [0, 0, w]$	$2x, x, 0 [0, 0, w]$	$\bar{x}, x, 0 [0, 0, w]$
6 e m'2m'	$x, 0, 1/2 [u, 0, 0]$	$0, x, 1/2 [0, u, 0]$	$\bar{x}, \bar{x}, 1/2 [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 0, 1/2 [\bar{u}, 0, 0]$	$0, \bar{x}, 1/2 [0, \bar{u}, 0]$	$x, x, 1/2 [u, u, 0]$
6 d m2'm'	$x, 0, 0 [0, 0, w]$	$0, x, 0 [0, 0, w]$	$\bar{x}, \bar{x}, 0 [0, 0, w]$
	$\bar{x}, 0, 0 [0, 0, w]$	$0, \bar{x}, 0 [0, 0, w]$	$x, x, 0 [0, 0, w]$
2 c 6m'm'	$0, 0, z [0, 0, w]$	$0, 0, \bar{z} [0, 0, w]$	
1 b 6/m'm'm'	$0, 0, 1/2 [0, 0, 0]$		
1 a 6/mm'm'	$0, 0, 0 [0, 0, w]$		

Continued

No. 73.8.376

$p_{2c} 6/mm'm'$

Symmetry of special projections

Along [001] $6mm1'$

Origin at 0,0,z

Along [100] $p_{2a^*} 2'mm'$

$a^* = c$

Origin at x,0,0

Along [210] $p_{2a^*} 2'mm'$

$a^* = c$

Origin at x,x/2,0

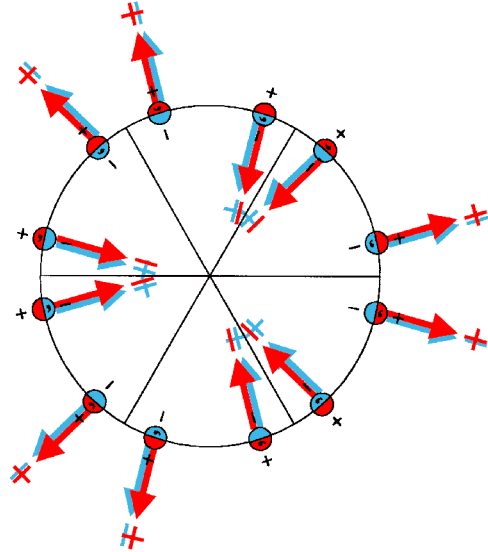
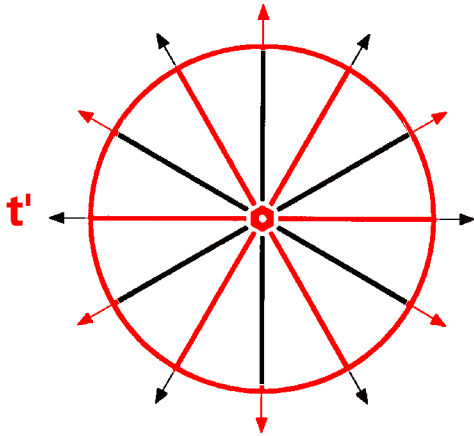
$\rho_{2c} 6'/m'mm'$

$6'/m'mm'$

Hexagonal

No. 73.9.377

$\rho_{2c} 6'/m'mm'$



Origin at center ($6'/m'mm'$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x/2$

Symmetry operations

For (0,0,0) + set

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) m' x,x,z
(m_3 0,0,0)' | (23) m' x,0,z
(m_2 0,0,0)' | (24) m' 0,y,z
(m_1 0,0,0)' |

For $(0,0,1)'$ + set

$$(1) t' (0,0,1) \\ (1|0,0,1)'$$

$$(4) 2 (0,0,1) \quad 0,0,z \\ (2_z|0,0,1)$$

$$(7) 2' \quad x,x,1/2 \\ (2_{xy}|0,0,1)'$$

$$(10) 2 \quad x,\bar{x},1/2 \\ (2_3|0,0,1)$$

$$(13) \bar{1}' \quad 0,0,1/2 \\ (\bar{1}|0,0,1)'$$

$$(16) m \quad x,y,1/2 \\ (m_z|0,0,1)$$

$$(19) c' (0,0,1) \quad x,\bar{x},z \\ (m_{xy}|0,0,1)'$$

$$(22) c (0,0,1) \quad x,x,z \\ (m_3|0,0,1)$$

$$(2) 3^{+'} (0,0,1) \quad 0,0,z \\ (3_z|0,0,1)'$$

$$(5) 6^- (0,0,1) \quad 0,0,z \\ (6_z^{-1}|0,0,1)$$

$$(8) 2' \quad x,0,1/2 \\ (2_x|0,0,1)'$$

$$(11) 2 \quad x,2x,1/2 \\ (2_2|0,0,1)$$

$$(14) \bar{3}^{+'} \quad 0,0,z; 0,0,1/2 \\ (\bar{3}_z|0,0,1)'$$

$$(17) \bar{6}^- \quad 0,0,z; 0,0,1/2 \\ (\bar{6}_z^{-1}|0,0,1)$$

$$(20) c' (0,0,1) \quad x,2x,z \\ (m_x|0,0,1)'$$

$$(23) c (0,0,1) \quad x,0,z \\ (m_2|0,0,1)$$

$$(3) 3^{-'} (0,0,1) \quad 0,0,z \\ (3_z^{-1}|0,0,1)'$$

$$(6) 6^+ (0,0,1) \quad 0,0,z \\ (6_z|0,0,1)$$

$$(9) 2' \quad 0,y,1/2 \\ (2_y|0,0,1)'$$

$$(12) 2 \quad 2x,x,1/2 \\ (2_1|0,0,1)$$

$$(15) \bar{3}^{-'} \quad 0,0,z; 0,0,1/2 \\ (\bar{3}_z^{-1}|0,0,1)'$$

$$(18) \bar{6}^+ \quad 0,0,z; 0,0,1/2 \\ (\bar{6}_z|0,0,1)$$

$$(21) c' (0,0,1) \quad 2x,x,z \\ (m_y|0,0,1)'$$

$$(24) c (0,0,1) \quad 0,y,z \\ (m_1|0,0,1)$$

Generators selected (1); $t(0,0,1)'$; (2); (4); (7); (13)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
24 l 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z [\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $y,x,\bar{z} [v,u,\bar{w}]$	(8) $x-y,\bar{y},\bar{z} [u-v,\bar{v},\bar{w}]$	(9) $\bar{x},\bar{x}+y,\bar{z} [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $\bar{y},\bar{x},\bar{z} [v,u,w]$	(11) $\bar{x}+y,y,\bar{z} [u-v,\bar{v},w]$	(12) $x,x-y,\bar{z} [\bar{u},\bar{u}+v,w]$
	(13) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(14) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$	(15) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$
	(16) $x,y,\bar{z} [u,v,\bar{w}]$	(17) $\bar{y},x-y,\bar{z} [\bar{v},u-v,\bar{w}]$	(18) $\bar{x}+y,\bar{x},\bar{z} [\bar{u}+v,\bar{u},\bar{w}]$
	(19) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(20) $\bar{x}+y,y,z [u-v,\bar{v},\bar{w}]$	(21) $x,x-y,z [\bar{u},\bar{u}+v,\bar{w}]$
	(22) $y,x,z [v,u,w]$	(23) $x-y,\bar{y},z [u-v,\bar{v},w]$	(24) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$
12 k m..	$x,y,1/2 [0,0,w]$	$\bar{y},x-y,1/2 [0,0,w]$	$\bar{x}+y,\bar{x},1/2 [0,0,w]$
	$\bar{x},\bar{y},1/2 [0,0,\bar{w}]$	$y,\bar{x}+y,1/2 [0,0,\bar{w}]$	$x-y,x,1/2 [0,0,\bar{w}]$
	$y,x,1/2 [0,0,\bar{w}]$	$x-y,\bar{y},1/2 [0,0,\bar{w}]$	$\bar{x},\bar{x}+y,1/2 [0,0,\bar{w}]$
	$\bar{y},\bar{x},1/2 [0,0,w]$	$\bar{x}+y,y,1/2 [0,0,w]$	$x,x-y,1/2 [0,0,w]$
12 j m'..	$x,y,0 [u,v,0]$	$\bar{y},x-y,0 [\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},0 [\bar{u}+v,\bar{u},0]$
	$\bar{x},\bar{y},0 [u,v,0]$	$y,\bar{x}+y,0 [\bar{v},u-v,0]$	$x-y,x,0 [\bar{u}+v,\bar{u},0]$
	$y,x,0 [v,u,0]$	$x-y,\bar{y},0 [u-v,\bar{v},0]$	$\bar{x},\bar{x}+y,0 [\bar{u},\bar{u}+v,0]$
	$\bar{y},\bar{x},0 [v,u,0]$	$\bar{x}+y,y,0 [u-v,\bar{v},0]$	$x,x-y,0 [\bar{u},\bar{u}+v,0]$

Continued

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 $p_{2c} 6'/m'mm'$

12 i .m.	$x, 2x, z [u, 0, 0]$	$2\bar{x}, \bar{x}, z [0, u, 0]$	$x, \bar{x}, z [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 2\bar{x}, z [u, 0, 0]$	$2x, x, z [0, u, 0]$	$\bar{x}, x, z [\bar{u}, \bar{u}, 0]$
	$2x, x, \bar{z} [0, u, 0]$	$\bar{x}, 2\bar{x}, \bar{z} [u, 0, 0]$	$\bar{x}, x, \bar{z} [\bar{u}, \bar{u}, 0]$
	$2\bar{x}, \bar{x}, \bar{z} [0, u, 0]$	$x, 2x, \bar{z} [u, 0, 0]$	$x, \bar{x}, \bar{z} [\bar{u}, \bar{u}, 0]$
12 h ..m'	$x, 0, z [u, 0, w]$	$0, x, z [0, u, w]$	$\bar{x}, \bar{x}, z [\bar{u}, \bar{u}, w]$
	$\bar{x}, 0, z [u, 0, \bar{w}]$	$0, \bar{x}, z [0, u, \bar{w}]$	$x, x, z [\bar{u}, \bar{u}, \bar{w}]$
	$0, x, \bar{z} [0, u, \bar{w}]$	$x, 0, \bar{z} [u, 0, \bar{w}]$	$\bar{x}, \bar{x}, \bar{z} [\bar{u}, \bar{u}, \bar{w}]$
	$0, \bar{x}, \bar{z} [0, u, w]$	$\bar{x}, 0, \bar{z} [u, 0, w]$	$x, x, \bar{z} [\bar{u}, \bar{u}, w]$
6 g mm ²	$x, 2x, 1/2 [0, 0, 0]$	$2\bar{x}, \bar{x}, 1/2 [0, 0, 0]$	$x, \bar{x}, 1/2 [0, 0, 0]$
	$\bar{x}, 2\bar{x}, 1/2 [0, 0, 0]$	$2x, x, 1/2 [0, 0, 0]$	$\bar{x}, x, 1/2 [0, 0, 0]$
6 f m'm ² '	$x, 2x, 0 [u, 0, 0]$	$2\bar{x}, \bar{x}, 0 [0, u, 0]$	$x, \bar{x}, 0 [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 2\bar{x}, 0 [u, 0, 0]$	$2x, x, 0 [0, u, 0]$	$\bar{x}, x, 0 [\bar{u}, \bar{u}, 0]$
6 e m ² m'	$x, 0, 1/2 [0, 0, w]$	$0, x, 1/2 [0, 0, w]$	$\bar{x}, \bar{x}, 1/2 [0, 0, w]$
	$\bar{x}, 0, 1/2 [0, 0, \bar{w}]$	$0, \bar{x}, 1/2 [0, 0, \bar{w}]$	$x, x, 1/2 [0, 0, \bar{w}]$
6 d m ² m'	$x, 0, 0 [u, 0, 0]$	$0, x, 0 [0, u, 0]$	$\bar{x}, \bar{x}, 0 [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 0, 0 [u, 0, 0]$	$0, \bar{x}, 0 [0, u, 0]$	$x, x, 0 [\bar{u}, \bar{u}, 0]$
2 c 6'mm'	$0, 0, z [0, 0, 0]$	$0, 0, \bar{z} [0, 0, 0]$	
1 b 6'/mmm'	$0, 0, 1/2 [0, 0, 0]$		
1 a 6'/m'mm'	$0, 0, 0 [0, 0, 0]$		

Continued

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$p_{2c} 6'/m'mm'$

Symmetry of special projections

Along [001] $6mm1'$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

Along [210] $p_{2a^*} 2'm'm$

$a^* = c$

Origin at x,x/2,0

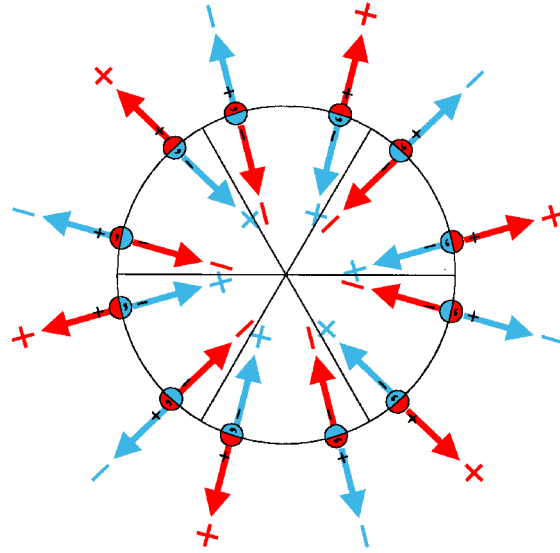
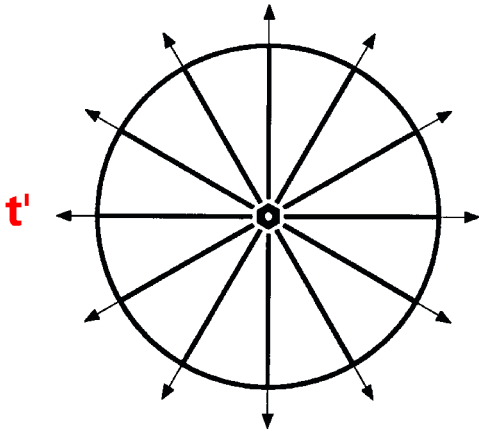
$p_{2c}6/mmm$

$6/mmm$

Hexagonal

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$p_{2c}6/mmm$



Origin at center ($6/mmm$)

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/2$; $y \leq x/2$

Symmetry operations

For (0,0,0) + set

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) m x,x,z
(m_3 0,0,0) | (23) m x,0,z
(m_2 0,0,0) | (24) m 0,y,z
(m_1 0,0,0) |

For $(0,0,1)'$ + set

$$(1) t' (0,0,1) \\ (1|0,0,1)'$$

$$(4) 2' (0,0,1) \quad 0,0,z \\ (2_z|0,0,1)'$$

$$(7) 2' \quad x,x,1/2 \\ (2_{xy}|0,0,1)'$$

$$(10) 2' \quad x,\bar{x},1/2 \\ (2_3|0,0,1)'$$

$$(13) \bar{1}' \quad 0,0,1/2 \\ (\bar{1}|0,0,1)'$$

$$(16) m' \quad x,y,1/2 \\ (m_z|0,0,1)'$$

$$(19) c' (0,0,1) \quad x,\bar{x},z \\ (m_{xy}|0,0,1)'$$

$$(22) c' (0,0,1) \quad x,x,z \\ (m_3|0,0,1)'$$

$$(2) 3^{+'} (0,0,1) \quad 0,0,z \\ (3_z|0,0,1)'$$

$$(5) 6^{-'} (0,0,1) \quad 0,0,z \\ (6_z^{-1}|0,0,1)'$$

$$(8) 2' \quad x,0,1/2 \\ (2_x|0,0,1)'$$

$$(11) 2' \quad x,2x,1/2 \\ (2_2|0,0,1)'$$

$$(14) \bar{3}^{+'} \quad 0,0,z; 0,0,1/2 \\ (\bar{3}_z|0,0,1)'$$

$$(17) \bar{6}^{-'} \quad 0,0,z; 0,0,1/2 \\ (\bar{6}_z^{-1}|0,0,1)'$$

$$(20) c' (0,0,1) \quad x,2x,z \\ (m_x|0,0,1)'$$

$$(23) c' (0,0,1) \quad x,0,z \\ (m_2|0,0,1)'$$

$$(3) 3^{-'} (0,0,1) \quad 0,0,z \\ (3_z^{-1}|0,0,1)'$$

$$(6) 6^{+'} (0,0,1) \quad 0,0,z \\ (6_z|0,0,1)'$$

$$(9) 2' \quad 0,y,1/2 \\ (2_y|0,0,1)'$$

$$(12) 2' \quad 2x,x,1/2 \\ (2_1|0,0,1)'$$

$$(15) \bar{3}^{-'} \quad 0,0,z; 0,0,1/2 \\ (\bar{3}_z^{-1}|0,0,1)'$$

$$(18) \bar{6}^{+'} \quad 0,0,z; 0,0,1/2 \\ (\bar{6}_z|0,0,1)'$$

$$(21) c' (0,0,1) \quad 2x,x,z \\ (m_y|0,0,1)'$$

$$(24) c' (0,0,1) \quad 0,y,z \\ (m_1|0,0,1)'$$

Generators selected (1); $t(0,0,1)'$; (2); (4); (7); (13)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		(0,0,0)+	(0,0,1)' +
24 l 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z [v,\bar{u}+v,w]$	(6) $x-y,x,z [u-v,u,w]$
	(7) $y,x,\bar{z} [v,u,\bar{w}]$	(8) $x-y,\bar{y},\bar{z} [u-v,\bar{v},\bar{w}]$	(9) $\bar{x},\bar{x}+y,\bar{z} [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $\bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]$	(11) $\bar{x}+y,y,\bar{z} [\bar{u}+v,v,\bar{w}]$	(12) $x,x-y,\bar{z} [u,u-v,\bar{w}]$
	(13) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(14) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$	(15) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$
	(16) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(17) $\bar{y},x-y,\bar{z} [v,\bar{u}+v,w]$	(18) $\bar{x}+y,\bar{x},\bar{z} [u-v,u,w]$
	(19) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(20) $\bar{x}+y,y,z [u-v,\bar{v},\bar{w}]$	(21) $x,x-y,z [\bar{u},\bar{u}+v,\bar{w}]$
	(22) $y,x,z [\bar{v},\bar{u},\bar{w}]$	(23) $x-y,\bar{y},z [\bar{u}+v,v,\bar{w}]$	(24) $\bar{x},\bar{x}+y,z [u,u-v,\bar{w}]$
12 k m'..	$x,y,1/2 [u,v,0]$	$\bar{y},x-y,1/2 [\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},1/2 [\bar{u}+v,\bar{u},0]$
	$\bar{x},\bar{y},1/2 [\bar{u},\bar{v},0]$	$y,\bar{x}+y,1/2 [v,\bar{u}+v,0]$	$x-y,x,1/2 [u-v,u,0]$
	$y,x,1/2 [v,u,0]$	$x-y,\bar{y},1/2 [u-v,\bar{v},0]$	$\bar{x},\bar{x}+y,1/2 [\bar{u},\bar{u}+v,0]$
	$\bar{y},\bar{x},1/2 [\bar{v},\bar{u},0]$	$\bar{x}+y,y,1/2 [\bar{u}+v,v,0]$	$x,x-y,1/2 [u,u-v,0]$
12 j m..	$x,y,0 [0,0,w]$	$\bar{y},x-y,0 [0,0,w]$	$\bar{x}+y,\bar{x},0 [0,0,w]$
	$\bar{x},\bar{y},0 [0,0,w]$	$y,\bar{x}+y,0 [0,0,w]$	$x-y,x,0 [0,0,w]$
	$y,x,0 [0,0,\bar{w}]$	$x-y,\bar{y},0 [0,0,\bar{w}]$	$\bar{x},\bar{x}+y,0 [0,0,\bar{w}]$
	$\bar{y},\bar{x},0 [0,0,\bar{w}]$	$\bar{x}+y,y,0 [0,0,\bar{w}]$	$x,x-y,0 [0,0,\bar{w}]$

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 $p_{2c} \bar{6}/mmm$

12 i .m.	$x, 2x, z [u, 0, 0]$	$2\bar{x}, \bar{x}, z [0, u, 0]$	$x, \bar{x}, z [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 2\bar{x}, z [\bar{u}, 0, 0]$	$2x, x, z [0, \bar{u}, 0]$	$\bar{x}, x, z [u, u, 0]$
	$2x, x, \bar{z} [0, u, 0]$	$\bar{x}, 2\bar{x}, \bar{z} [u, 0, 0]$	$\bar{x}, x, \bar{z} [\bar{u}, \bar{u}, 0]$
	$2\bar{x}, \bar{x}, \bar{z} [0, \bar{u}, 0]$	$x, 2x, \bar{z} [\bar{u}, 0, 0]$	$x, \bar{x}, \bar{z} [u, u, 0]$
12 h ..m	$x, 0, z [u, 2u, 0]$	$0, x, z [2\bar{u}, \bar{u}, 0]$	$\bar{x}, \bar{x}, z [u, \bar{u}, 0]$
	$\bar{x}, 0, z [\bar{u}, 2\bar{u}, 0]$	$0, \bar{x}, z [2u, u, 0]$	$x, x, z [\bar{u}, u, 0]$
	$0, x, \bar{z} [2u, u, 0]$	$x, 0, \bar{z} [\bar{u}, 2\bar{u}, 0]$	$\bar{x}, \bar{x}, \bar{z} [\bar{u}, u, 0]$
	$0, \bar{x}, \bar{z} [2\bar{u}, \bar{u}, 0]$	$\bar{x}, 0, \bar{z} [u, 2u, 0]$	$x, x, \bar{z} [u, \bar{u}, 0]$
6 g m'm2'	$x, 2x, 1/2 [u, 0, 0]$	$2\bar{x}, \bar{x}, 1/2 [0, u, 0]$	$x, \bar{x}, 1/2 [\bar{u}, \bar{u}, 0]$
	$\bar{x}, 2\bar{x}, 1/2 [\bar{u}, 0, 0]$	$2x, x, 1/2 [0, \bar{u}, 0]$	$\bar{x}, x, 1/2 [u, u, 0]$
6 f mm2	$x, 2x, 0 [0, 0, 0]$	$2\bar{x}, \bar{x}, 0 [0, 0, 0]$	$x, \bar{x}, 0 [0, 0, 0]$
	$\bar{x}, 2\bar{x}, 0 [0, 0, 0]$	$2x, x, 0 [0, 0, 0]$	$\bar{x}, x, 0 [0, 0, 0]$
6 e m'2'm	$x, 0, 1/2 [u, 2u, 0]$	$0, x, 1/2 [2\bar{u}, \bar{u}, 0]$	$\bar{x}, \bar{x}, 1/2 [u, \bar{u}, 0]$
	$\bar{x}, 0, 1/2 [\bar{u}, 2\bar{u}, 0]$	$0, \bar{x}, 1/2 [2u, u, 0]$	$x, x, 1/2 [\bar{u}, u, 0]$
6 d m2m	$x, 0, 0 [0, 0, 0]$	$0, x, 0 [0, 0, 0]$	$\bar{x}, \bar{x}, 0 [0, 0, 0]$
	$\bar{x}, 0, 0 [0, 0, 0]$	$0, \bar{x}, 0 [0, 0, 0]$	$x, x, 0 [0, 0, 0]$
2 c 6mm	$0, 0, z [0, 0, w]$	$0, 0, \bar{z} [0, 0, \bar{w}]$	
1 b 6/m'mm	$0, 0, 1/2 [0, 0, 0]$		
1 a 6/mmm	$0, 0, 0 [0, 0, 0]$		

Continued

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$p_{2c} 6/mmm$

Symmetry of special projections

Along [001] $6mm1'$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = c$

Origin at x,0,0

Along [210] $p2mm1'$

$a^* = c$

Origin at x,x/2,0

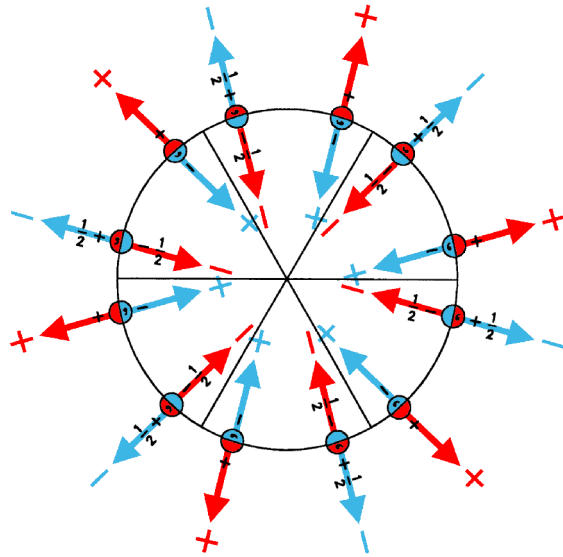
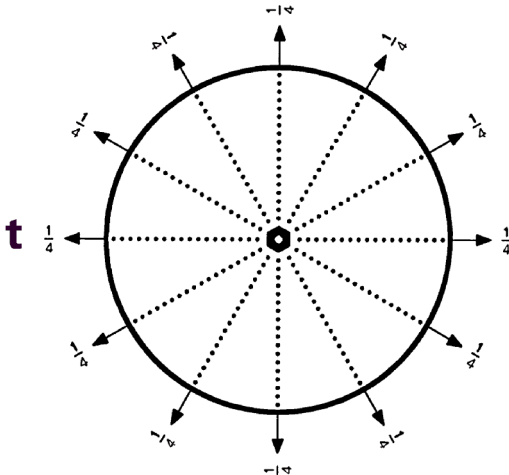
$p6/mcc$

$6/mmm$

Hexagonal

No. 74.1.379

$p6/m2/c2/c$



Origin at center ($6/m$) at $6/mcc$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$; $y \leq x$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,1/4
(2_{xy} 0,0,1/2) | (8) 2 x,0,1/4
(2_x 0,0,1/2) | (9) 2 0,y,1/4
(2_y 0,0,1/2) |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) c (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2) | (20) c (0,0,1/2) x,2x,z
(m_x 0,0,1/2) | (21) c (0,0,1/2) 2x,x,z
(m_y 0,0,1/2) |
| (22) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (23) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (24) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 g 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z$ [$u-v,u,w$]
	(7) $y,x,\bar{z}+1/2$ [v,u,\bar{w}]	(8) $x-y,\bar{y},\bar{z}+1/2$ [$u-v,\bar{v},\bar{w}$]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/2$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/2$ [$u,u-v,\bar{w}$]
	(13) \bar{x},\bar{y},\bar{z} [u,v,w]	(14) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(15) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]
	(16) x,y,\bar{z} [\bar{u},\bar{v},w]	(17) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [$u-v,u,w$]
	(19) $\bar{y},\bar{x},z+1/2$ [v,u,\bar{w}]	(20) $\bar{x}+y,y,z+1/2$ [$u-v,\bar{v},\bar{w}$]	(21) $x,x-y,z+1/2$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(22) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]	(23) $x-y,\bar{y},z+1/2$ [$\bar{u}+v,v,\bar{w}$]	(24) $\bar{x},\bar{x}+y,z+1/2$ [$u,u-v,\bar{w}$]
12 f m..	$x,y,0$ [0,0,w]	$\bar{y},x-y,0$ [0,0,w]	$\bar{x}+y,\bar{x},0$ [0,0,w]
	$\bar{x},\bar{y},0$ [0,0,w]	$y,\bar{x}+y,0$ [0,0,w]	$x-y,x,0$ [0,0,w]
	$y,x,1/2$ [0,0, \bar{w}]	$x-y,\bar{y},1/2$ [0,0, \bar{w}]	$\bar{x},\bar{x}+y,1/2$ [0,0, \bar{w}]
	$\bar{y},\bar{x},1/2$ [0,0, \bar{w}]	$\bar{x}+y,y,1/2$ [0,0, \bar{w}]	$x,x-y,1/2$ [0,0, \bar{w}]
12 e ..2	$x,2x,1/4$ [u,2u,0]	$2\bar{x},\bar{x},1/4$ [2 $\bar{u},\bar{u},0$]	$x,\bar{x},1/4$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},1/4$ [$\bar{u},2\bar{u},0$]	$2x,x,1/4$ [2u,u,0]	$\bar{x},x,1/4$ [$\bar{u},u,0$]
	$2x,x,3/4$ [2 $\bar{u},\bar{u},0$]	$\bar{x},2\bar{x},3/4$ [u,2u,0]	$\bar{x},x,3/4$ [u, $\bar{u},0$]
	$2\bar{x},\bar{x},3/4$ [2u,u,0]	$x,2x,3/4$ [$\bar{u},2\bar{u},0$]	$x,\bar{x},3/4$ [$\bar{u},u,0$]

Continued

No. 74.1.379

p6/mcc

12 d .2.	x,0,1/4 [u,0,0]	0,x,1/4 [0,u,0]	$\bar{x},\bar{x},1/4 [\bar{u},\bar{u},0]$
	$\bar{x},0,1/4 [\bar{u},0,0]$	0, $\bar{x},1/4 [0,\bar{u},0]$	x,x,1/4 [u,u,0]
	$\bar{x},0,3/4 [u,0,0]$	0, $\bar{x},3/4 [0,u,0]$	x,x,3/4 [$\bar{u},\bar{u},0$]
	x,0,3/4 [$\bar{u},0,0$]	0,x,3/4 [0, $\bar{u},0$]	$\bar{x},\bar{x},3/4 [u,u,0]$
4 c 6..	0,0,z [0,0,w]	0,0, $\bar{z}+1/2 [0,0,\bar{w}]$	
	0,0, $\bar{z} [0,0,w]$	0,0,z+1/2 [0,0, $\bar{w}]$	
2 b 6/m..	0,0,0 [0,0,w]	0,0,1/2 [0,0, $\bar{w}]$	
2 a 622	0,0,1/4 [0,0,0]	0,0,3/4 [0,0,0]	

Symmetry of special projections

Along [001] 6mm	Along [100] $p_{2a^*}2'mm'$	Along [210] $p_{2a^*}2'mm'$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

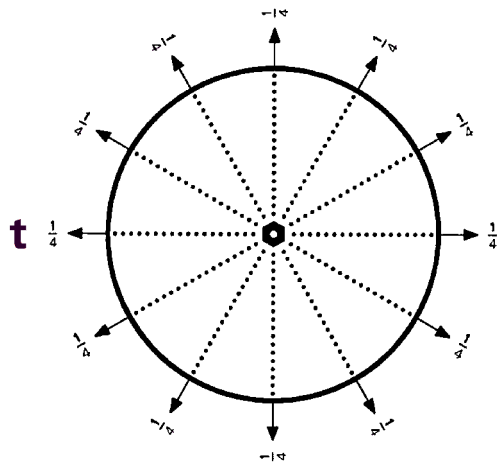
$p6/mcc1'$

$6/mmm1'$

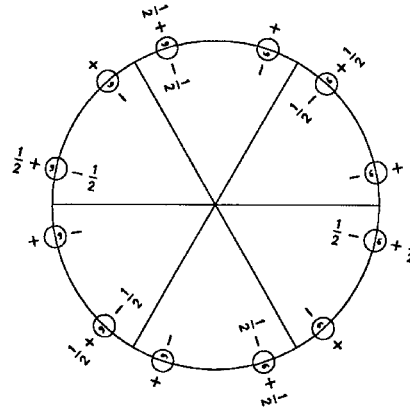
Hexagonal

No. 74.2.380

$p6/m2/c2/c1'$



1'



Origin at center ($6/m1'$) at $6/mcc1'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$; $y \leq x$

Symmetry operations

For 1 + set

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,1/4
(2_{xy} 0,0,1/2) | (8) 2 x,0,1/4
(2_x 0,0,1/2) | (9) 2 0,y,1/4
(2_y 0,0,1/2) |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) c (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2) | (20) c (0,0,1/2) x,2x,z
(m_x 0,0,1/2) | (21) c (0,0,1/2) 2x,x,z
(m_y 0,0,1/2) |
| (22) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (23) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (24) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

For 1' + set

- | | | |
|---|--|--|
| (1) 1'
(1 0,0,0)' | (2) 3 ⁺ ' 0,0,z
(3 _z ⁻¹ 0,0,0)' | (3) 3 ⁻ ' 0,0,z
(3 _z ⁻¹ 0,0,0)' |
| (4) 2' 0,0,z
(2 _z 0,0,0)' | (5) 6 ⁻ ' 0,0,z
(6 _z ⁻¹ 0,0,0)' | (6) 6 ⁺ ' 0,0,z
(6 _z 0,0,0)' |
| (7) 2' x,x,1/4
(2 _{xy} 0,0,1/2)' | (8) 2' x,0,1/4
(2 _x 0,0,1/2)' | (9) 2' 0,y,1/4
(2 _y 0,0,1/2)' |
| (10) 2' x,x̄,1/4
(2 ₃ 0,0,1/2)' | (11) 2' x,2x,1/4
(2 ₂ 0,0,1/2)' | (12) 2' 2x,x,1/4
(2 ₁ 0,0,1/2)' |
| (13) 1̄' 0,0,0
(1̄ 0,0,0)' | (14) 3̄ ⁺ ' 0,0,z; 0,0,0
(3̄ _z 0,0,0)' | (15) 3̄ ⁻ ' 0,0,z; 0,0,0
(3̄ _z ⁻¹ 0,0,0)' |
| (16) m' x,y,0
(m _z 0,0,0)' | (17) 6̄ ⁻ ' 0,0,z; 0,0,0
(6̄ _z ⁻¹ 0,0,0)' | (18) 6̄ ⁺ ' 0,0,z; 0,0,0
(6̄ _z 0,0,0)' |
| (19) c' (0,0,1/2) x,x̄,z
(m _{xy} 0,0,1/2)' | (20) c' (0,0,1/2) x,2x,z
(m _x 0,0,1/2)' | (21) c' (0,0,1/2) 2x,x,z
(m _y 0,0,1/2)' |
| (22) c' (0,0,1/2) x,x,z
(m ₃ 0,0,1/2)' | (23) c' (0,0,1/2) x,0,z
(m ₂ 0,0,1/2)' | (24) c' (0,0,1/2) 0,y,z
(m ₁ 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (4); (7); (13); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
24 g 11'	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) \bar{x},\bar{y},z [0,0,0]	(5) $y,\bar{x}+y,z$ [0,0,0]	(6) x-y,x,z [0,0,0]
	(7) y,x, $\bar{z}+1/2$ [0,0,0]	(8) x-y, $\bar{y},\bar{z}+1/2$ [0,0,0]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/2$ [0,0,0]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [0,0,0]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [0,0,0]	(12) x,x-y, $\bar{z}+1/2$ [0,0,0]
	(13) \bar{x},\bar{y},\bar{z} [0,0,0]	(14) $y,\bar{x}+y,\bar{z}$ [0,0,0]	(15) x-y,x, \bar{z} [0,0,0]
	(16) x,y, \bar{z} [0,0,0]	(17) $\bar{y},x-y,\bar{z}$ [0,0,0]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [0,0,0]
	(19) $\bar{y},\bar{x},z+1/2$ [0,0,0]	(20) $\bar{x}+y,y,z+1/2$ [0,0,0]	(21) x,x-y,z+1/2 [0,0,0]
	(22) y,x,z+1/2 [0,0,0]	(23) x-y, $\bar{y},z+1/2$ [0,0,0]	(24) $\bar{x},\bar{x}+y,z+1/2$ [0,0,0]
12 f m..1'	x,y,0 [0,0,0]	$\bar{y},x-y,0$ [0,0,0]	$\bar{x}+y,\bar{x},0$ [0,0,0]
	$\bar{x},\bar{y},0$ [0,0,0]	y, $\bar{x}+y,0$ [0,0,0]	x-y,x,0 [0,0,0]
	y,x,1/2 [0,0,0]	x-y, $\bar{y},1/2$ [0,0,0]	$\bar{x},\bar{x}+y,1/2$ [0,0,0]
	$\bar{y},\bar{x},1/2$ [0,0,0]	$\bar{x}+y,y,1/2$ [0,0,0]	x,x-y,1/2 [0,0,0]
12 e ..21'	x,2x,1/4 [0,0,0]	2 $\bar{x},\bar{x},1/4$ [0,0,0]	x, $\bar{x},1/4$ [0,0,0]
	$\bar{x},2\bar{x},1/4$ [0,0,0]	2x,x,1/4 [0,0,0]	$\bar{x},x,1/4$ [0,0,0]
	2x,x,3/4 [0,0,0]	$\bar{x},2\bar{x},3/4$ [0,0,0]	$\bar{x},x,3/4$ [0,0,0]
	2 $\bar{x},\bar{x},3/4$ [0,0,0]	x,2x,3/4 [0,0,0]	x, $\bar{x},3/4$ [0,0,0]

Continued

No. 74.2.380

 $p6/mcc1'$

12 d	.2.1'	$x, 0, 1/4 [0, 0, 0]$	$0, x, 1/4 [0, 0, 0]$	$\bar{x}, \bar{x}, 1/4 [0, 0, 0]$
		$\bar{x}, 0, 1/4 [0, 0, 0]$	$0, \bar{x}, 1/4 [0, 0, 0]$	$x, x, 1/4 [0, 0, 0]$
		$\bar{x}, 0, 3/4 [0, 0, 0]$	$0, \bar{x}, 3/4 [0, 0, 0]$	$x, x, 3/4 [0, 0, 0]$
		$x, 0, 3/4 [0, 0, 0]$	$0, x, 3/4 [0, 0, 0]$	$\bar{x}, \bar{x}, 3/4 [0, 0, 0]$
4 c	6..1'	$0, 0, z [0, 0, 0]$	$0, 0, \bar{z} + 1/2 [0, 0, 0]$	
		$0, 0, \bar{z} [0, 0, 0]$	$0, 0, z + 1/2 [0, 0, 0]$	
2 b	6/m..1'	$0, 0, 0 [0, 0, 0]$	$0, 0, 1/2 [0, 0, 0]$	
2 a	6221'	$0, 0, 1/4 [0, 0, 0]$	$0, 0, 3/4 [0, 0, 0]$	

Symmetry of special projectionsAlong [001] $6mm1'$ Origin at $0, 0, z$ Along [100] $p2mm1'$ $a^* = c/2$ Origin at $x, 0, 0$ Along [210] $p2mm1'$ $a^* = c/2$ Origin at $x, x/2, 0$

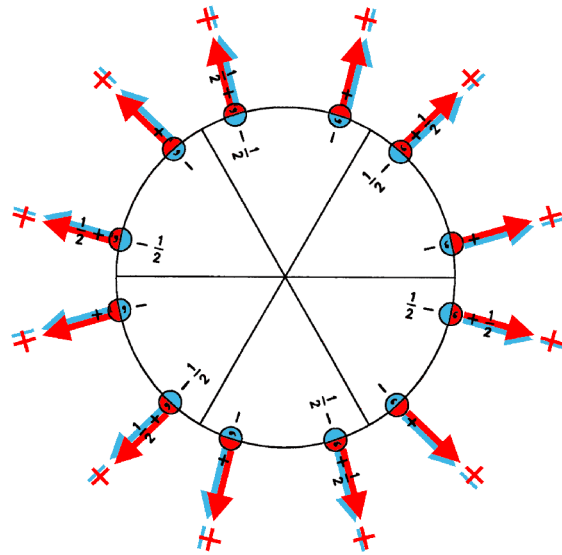
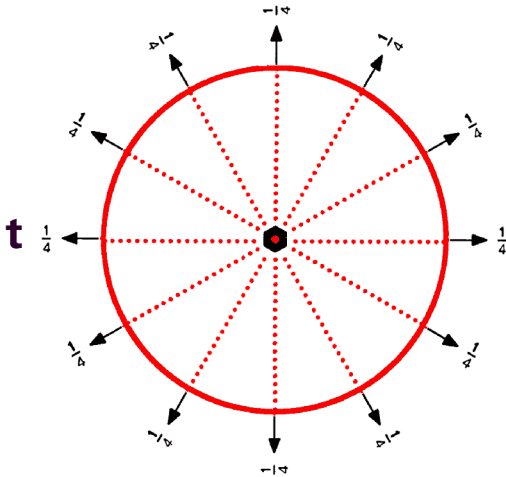
$p6/m'c'c'$

$6/m'm'm'$

Hexagonal

No. 74.3.381

$p6/m'2/c'2/c'$



Origin at center ($6/m'$) at $6/m'c'c'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$; $y \leq x$

Symmetry operations

- | | | |
|--|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,1/4
(2_{xy} 0,0,1/2) | (8) 2 x,0,1/4
(2_x 0,0,1/2) | (9) 2 0,y,1/4
(2_y 0,0,1/2) |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) c' (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2)' | (20) c' (0,0,1/2) x,2x,z
(m_x 0,0,1/2)' | (21) c' (0,0,1/2) 2x,x,z
(m_y 0,0,1/2)' |
| (22) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (23) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (24) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 g 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z$ [u-v,u,w]
	(7) $y,x,\bar{z}+1/2$ [v,u, \bar{w}]	(8) $x-y,\bar{y},\bar{z}+1/2$ [u-v, \bar{v},\bar{w}]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/2$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/2$ [u,u-v, \bar{w}]
	(13) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(14) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(15) $x-y,x,\bar{z}$ [u-v,u, \bar{w}]
	(16) x,y,\bar{z} [u,v, \bar{w}]	(17) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(19) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(20) $\bar{x}+y,y,z+1/2$ [$\bar{u}+v,v,w$]	(21) $x,x-y,z+1/2$ [u,u-v,w]
	(22) $y,x,z+1/2$ [v,u,w]	(23) $x-y,\bar{y},z+1/2$ [u-v, \bar{v},w]	(24) $\bar{x},\bar{x}+y,z+1/2$ [$\bar{u},\bar{u}+v,w$]
12 f m'..	$x,y,0$ [u,v,0]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$y,\bar{x}+y,0$ [$v,\bar{u}+v,0$]	$x-y,x,0$ [u-v,u,0]
	$y,x,1/2$ [v,u,0]	$x-y,\bar{y},1/2$ [u-v, $\bar{v},0$]	$\bar{x},\bar{x}+y,1/2$ [$\bar{u},\bar{u}+v,0$]
	$\bar{y},\bar{x},1/2$ [$\bar{v},\bar{u},0$]	$\bar{x}+y,y,1/2$ [$\bar{u}+v,v,0$]	$x,x-y,1/2$ [u,u-v,0]
12 e ..2	$x,2x,1/4$ [u,2u,0]	$2\bar{x},\bar{x},1/4$ [$2\bar{u},\bar{u},0$]	$x,\bar{x},1/4$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},1/4$ [$\bar{u},2\bar{u},0$]	$2x,x,1/4$ [2u,u,0]	$\bar{x},x,1/4$ [$\bar{u},u,0$]
	$2x,x,3/4$ [2u,u,0]	$\bar{x},2\bar{x},3/4$ [$\bar{u},2\bar{u},0$]	$\bar{x},x,3/4$ [$\bar{u},u,0$]
	$2\bar{x},\bar{x},3/4$ [$2\bar{u},\bar{u},0$]	$x,2x,3/4$ [u,2u,0]	$x,\bar{x},3/4$ [u, $\bar{u},0$]

Continued

No. 74.3.381

 $p6/m'c'$

12 d .2.	$x,0,1/4 [u,0,0]$	$0,x,1/4 [0,u,0]$	$\bar{x},\bar{x},1/4 [\bar{u},\bar{u},0]$
	$\bar{x},0,1/4 [\bar{u},0,0]$	$0,\bar{x},1/4 [0,\bar{u},0]$	$x,x,1/4 [u,u,0]$
	$\bar{x},0,3/4 [\bar{u},0,0]$	$0,\bar{x},3/4 [0,\bar{u},0]$	$x,x,3/4 [u,u,0]$
	$x,0,3/4 [u,0,0]$	$0,x,3/4 [0,u,0]$	$\bar{x},\bar{x},3/4 [\bar{u},\bar{u},0]$
4 c 6..	$0,0,z [0,0,w]$	$0,0,\bar{z}+1/2 [0,0,\bar{w}]$	
	$0,0,\bar{z} [0,0,\bar{w}]$	$0,0,z+1/2 [0,0,w]$	
2 b $6/m'..$	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$	
2 a 622	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$	

Symmetry of special projectionsAlong [001] $6mm1'$ Origin at $0,0,z$ Along [100] $p2m'm'$ $a^* = c/2$ Origin at $x,0,0$ Along [210] $p2m'm'$ $a^* = c/2$ Origin at $x,x/2,0$

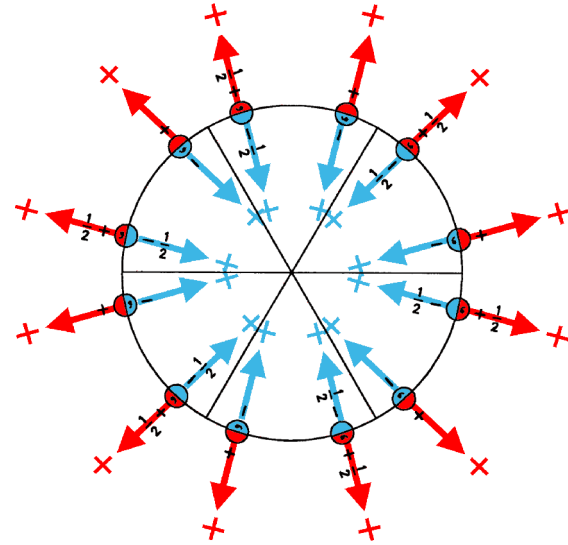
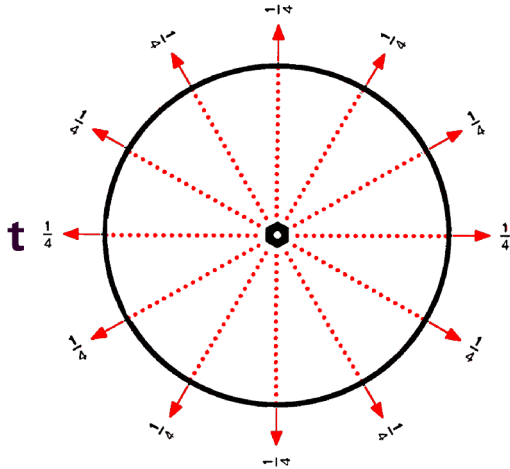
$p6/mc'c'$

$6/m\bar{m}'m'$

Hexagonal

No. 74.4.382

$p6/m2'c'2'/c'$



Origin at center ($6/m$) at $6/mc'c'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$; $y \leq x$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $2'$ x,x,1/4
(2_{xy} 0,0,1/2)' | (8) $2'$ x,0,1/4
(2_x 0,0,1/2)' | (9) $2'$ 0,y,1/4
(2_y 0,0,1/2)' |
| (10) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (12) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) c' (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2)' | (20) c' (0,0,1/2) x,2x,z
(m_x 0,0,1/2)' | (21) c' (0,0,1/2) 2x,x,z
(m_y 0,0,1/2)' |
| (22) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (23) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (24) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1)	(2)	(3)
24 g 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
	(4) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]	(5) $y, \bar{x}+y, z$ [$v, \bar{u}+v, w$]	(6) $x-y, x, z$ [$u-v, u, w$]
	(7) $y, x, \bar{z}+1/2$ [\bar{v}, \bar{u}, w]	(8) $x-y, \bar{y}, \bar{z}+1/2$ [$\bar{u}+v, v, w$]	(9) $\bar{x}, \bar{x}+y, \bar{z}+1/2$ [$u, u-v, w$]
	(10) $\bar{y}, \bar{x}, \bar{z}+1/2$ [v, u, w]	(11) $\bar{x}+y, y, \bar{z}+1/2$ [$u-v, \bar{v}, w$]	(12) $x, x-y, \bar{z}+1/2$ [$\bar{u}, \bar{u}+v, w$]
	(13) $\bar{x}, \bar{y}, \bar{z}$ [u,v,w]	(14) $y, \bar{x}+y, \bar{z}$ [$\bar{v}, u-v, w$]	(15) $x-y, x, \bar{z}$ [$\bar{u}+v, \bar{u}, w$]
	(16) x, y, \bar{z} [\bar{u}, \bar{v}, w]	(17) $\bar{y}, x-y, \bar{z}$ [$v, \bar{u}+v, w$]	(18) $\bar{x}+y, \bar{x}, \bar{z}$ [$u-v, u, w$]
	(19) $\bar{y}, \bar{x}, z+1/2$ [\bar{v}, \bar{u}, w]	(20) $\bar{x}+y, y, z+1/2$ [$\bar{u}+v, v, w$]	(21) $x, x-y, z+1/2$ [$u, u-v, w$]
(22) $y, x, z+1/2$ [v, u, w]	(23) $x-y, \bar{y}, z+1/2$ [$u-v, \bar{v}, w$]	(24) $\bar{x}, \bar{x}+y, z+1/2$ [$\bar{u}, \bar{u}+v, w$]	
12 f m..	$x, y, 0$ [0,0,w]	$\bar{y}, x-y, 0$ [0,0,w]	$\bar{x}+y, \bar{x}, 0$ [0,0,w]
	$\bar{x}, \bar{y}, 0$ [0,0,w]	$y, \bar{x}+y, 0$ [0,0,w]	$x-y, x, 0$ [0,0,w]
	$y, x, 1/2$ [0,0,w]	$x-y, \bar{y}, 1/2$ [0,0,w]	$\bar{x}, \bar{x}+y, 1/2$ [0,0,w]
	$\bar{y}, \bar{x}, 1/2$ [0,0,w]	$\bar{x}+y, y, 1/2$ [0,0,w]	$x, x-y, 1/2$ [0,0,w]
12 e ..2'	$x, 2x, 1/4$ [u,0,w]	$2\bar{x}, \bar{x}, 1/4$ [0,u,w]	$x, \bar{x}, 1/4$ [\bar{u}, \bar{u}, w]
	$\bar{x}, 2\bar{x}, 1/4$ [$\bar{u}, 0, w$]	$2x, x, 1/4$ [0, \bar{u}, w]	$\bar{x}, x, 1/4$ [u,u,w]
	$2x, x, 3/4$ [0,u,w]	$\bar{x}, 2\bar{x}, 3/4$ [u,0,w]	$\bar{x}, x, 3/4$ [\bar{u}, \bar{u}, w]
	$2\bar{x}, \bar{x}, 3/4$ [0, \bar{u}, w]	$x, 2x, 3/4$ [$\bar{u}, 0, w$]	$x, \bar{x}, 3/4$ [u,u,w]

Continued

No. 74.4.382

 $p6/mc'c'$

12 d .2'	$x,0,1/4 [u,2u,w]$	$0,x,1/4 [2\bar{u},\bar{u},w]$	$\bar{x},\bar{x},1/4 [u,\bar{u},w]$
	$\bar{x},0,1/4 [\bar{u},2\bar{u},w]$	$0,\bar{x},1/4 [2u,u,w]$	$x,x,1/4 [\bar{u},u,w]$
	$\bar{x},0,3/4 [u,2u,w]$	$0,\bar{x},3/4 [2\bar{u},\bar{u},w]$	$x,x,3/4 [u,\bar{u},w]$
	$x,0,3/4 [\bar{u},2\bar{u},w]$	$0,x,3/4 [2u,u,w]$	$\bar{x},\bar{x},3/4 [\bar{u},u,w]$
4 c 6..	$0,0,z [0,0,w]$	$0,0,\bar{z}+1/2 [0,0,w]$	
	$0,0,\bar{z} [0,0,w]$	$0,0,z+1/2 [0,0,w]$	
2 b 6/m..	$0,0,0 [0,0,w]$	$0,0,1/2 [0,0,w]$	
2 a 62'2'	$0,0,1/4 [0,0,w]$	$0,0,3/4 [0,0,w]$	

Symmetry of special projectionsAlong [001] $6m'm'$

Origin at 0,0,z

Along [100] $p2'mm'$ $a^* = c/2$

Origin at x,0,0

Along [210] $p2'mm'$ $a^* = c/2$

Origin at x,x/2,0

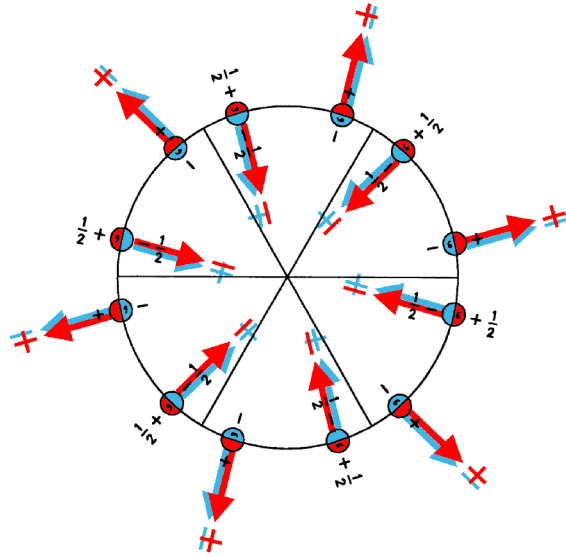
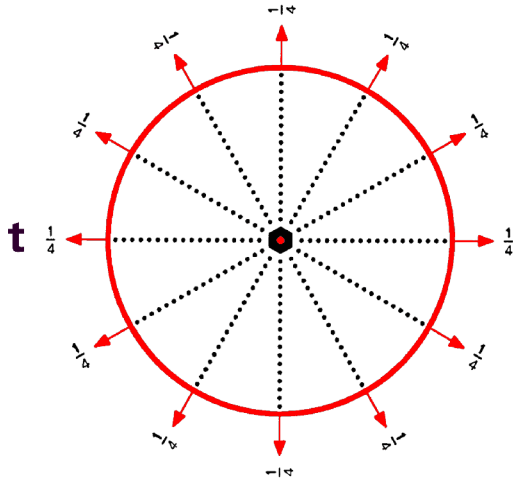
$p6/m'cc$

$6/m'mm$

Hexagonal

No. 74.5.383

$p6/m'2'c2'/c$



Origin at center ($6/m'$) at $6/m'cc$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$; $y \leq x$

Symmetry operations

- | | | |
|--|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $2'$ x,x,1/4
(2_{xy} 0,0,1/2)' | (8) $2'$ x,0,1/4
(2_x 0,0,1/2)' | (9) $2'$ 0,y,1/4
(2_y 0,0,1/2)' |
| (10) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (12) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) c (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2) | (20) c (0,0,1/2) x,2x,z
(m_x 0,0,1/2) | (21) c (0,0,1/2) 2x,x,z
(m_y 0,0,1/2) |
| (22) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (23) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (24) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 g 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) x-y,x,z [u-v,u,w]
	(7) y,x, $\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) x-y, $\bar{y},\bar{z}+1/2$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/2$ [u,u-v,w]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [u-v, \bar{v},w]	(12) x,x-y, $\bar{z}+1/2$ [$\bar{u},\bar{u}+v,w$]
	(13) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(14) $y,\bar{x}+y,\bar{z}$ [v, $\bar{u}+v,\bar{w}$]	(15) x-y,x, \bar{z} [u-v,u, \bar{w}]
	(16) x,y, \bar{z} [u,v, \bar{w}]	(17) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(19) $\bar{y},\bar{x},z+1/2$ [v,u, \bar{w}]	(20) $\bar{x}+y,y,z+1/2$ [u-v, \bar{v},\bar{w}]	(21) x,x-y,z+1/2 [$\bar{u},\bar{u}+v,\bar{w}$]
	(22) y,x,z+1/2 [\bar{v},\bar{u},\bar{w}]	(23) x-y, $\bar{y},z+1/2$ [$\bar{u}+v,v,\bar{w}$]	(24) $\bar{x},\bar{x}+y,z+1/2$ [u,u-v, \bar{w}]
12 f m..	x,y,0 [u,v,0]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	y, $\bar{x}+y,0$ [v, $\bar{u}+v,0$]	x-y,x,0 [u-v,u,0]
	y,x,1/2 [$\bar{v},\bar{u},0$]	x-y, $\bar{y},1/2$ [$\bar{u}+v,v,0$]	$\bar{x},\bar{x}+y,1/2$ [u,u-v,0]
	$\bar{y},\bar{x},1/2$ [v,u,0]	$\bar{x}+y,y,1/2$ [u-v, $\bar{v},0$]	x,x-y,1/2 [$\bar{u},\bar{u}+v,0$]
12 e ..2	x,2x,1/4 [u,0,w]	2 $\bar{x},\bar{x},1/4$ [0,u,w]	x, $\bar{x},1/4$ [\bar{u},\bar{u},w]
	$\bar{x},2\bar{x},1/4$ [$\bar{u},0,w$]	2x,x,1/4 [0, \bar{u},w]	$\bar{x},x,1/4$ [u,u,w]
	2x,x,3/4 [0, \bar{u},\bar{w}]	$\bar{x},2\bar{x},3/4$ [$\bar{u},0,\bar{w}$]	$\bar{x},x,3/4$ [u,u, \bar{w}]
	2 $\bar{x},\bar{x},3/4$ [0,u, \bar{w}]	x,2x,3/4 [u,0, \bar{w}]	x, $\bar{x},3/4$ [\bar{u},\bar{u},\bar{w}]

Continued

No. 74.5.383

 $p6/m'cc$

12 d .2'	$x,0,1/4 [u,2u,w]$	$0,x,1/4 [2\bar{u},\bar{u},w]$	$\bar{x},\bar{x},1/4 [u,\bar{u},w]$
	$\bar{x},0,1/4 [\bar{u},2\bar{u},w]$	$0,\bar{x},1/4 [2u,u,w]$	$x,x,1/4 [\bar{u},u,w]$
	$\bar{x},0,3/4 [\bar{u},2\bar{u},\bar{w}]$	$0,\bar{x},3/4 [2u,u,\bar{w}]$	$x,x,3/4 [\bar{u},u,\bar{w}]$
	$x,0,3/4 [u,2u,\bar{w}]$	$0,x,3/4 [2\bar{u},\bar{u},\bar{w}]$	$\bar{x},\bar{x},3/4 [\bar{u},u,\bar{w}]$
4 c 6..	$0,0,z [0,0,w]$	$0,0,\bar{z}+1/2 [0,0,w]$	
	$0,0,\bar{z} [0,0,\bar{w}]$	$0,0,z+1/2 [0,0,\bar{w}]$	
2 b $6/m'..$	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$	
2 a $6'2'2'$	$0,0,1/4 [0,0,w]$	$0,0,3/4 [0,0,\bar{w}]$	

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $p_{2a^*}2m'm'$	Along [210] $p_{2a^*}2m'm'$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

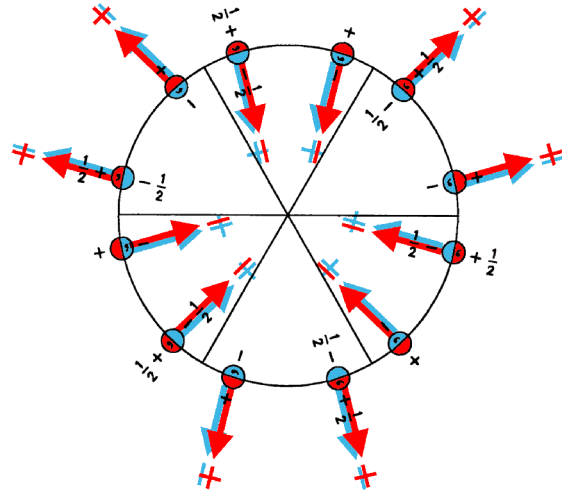
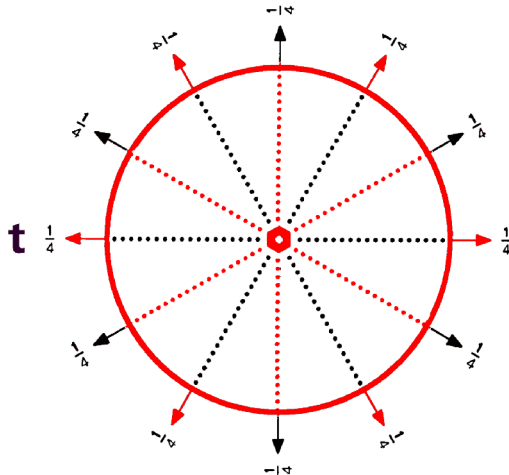
$p6'/m'c'c$

$6'/m'm'm$

Hexagonal

No. 74.6.384

$p6'/m'2'/c'2/c$



Origin at center ($6'/m'$) at $6'/m'c'c$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$; $y \leq x$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) $2'$ x,x,1/4
(2_{xy} 0,0,1/2)' | (8) $2'$ x,0,1/4
(2_x 0,0,1/2)' | (9) $2'$ 0,y,1/4
(2_y 0,0,1/2)' |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) c' (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2)' | (20) c' (0,0,1/2) x,2x,z
(m_x 0,0,1/2)' | (21) c' (0,0,1/2) 2x,x,z
(m_y 0,0,1/2)' |
| (22) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (23) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (24) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 g 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v, \bar{w}]	(5) $y,\bar{x}+y,z$ [$\bar{v},u-v,\bar{w}$]	(6) x-y,x,z [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) y,x, $\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) x-y, $\bar{y},\bar{z}+1/2$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/2$ [u,u-v,w]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) x,x-y, $\bar{z}+1/2$ [u,u-v, \bar{w}]
	(13) \bar{x},\bar{y},\bar{z} [u,v,w]	(14) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(15) x-y,x, \bar{z} [$\bar{u}+v,\bar{u},w$]
	(16) x,y, \bar{z} [u,v, \bar{w}]	(17) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(19) $\bar{y},\bar{x},z+1/2$ [\bar{v},\bar{u},w]	(20) $\bar{x}+y,y,z+1/2$ [$\bar{u}+v,v,w$]	(21) x,x-y,z+1/2 [u,u-v,w]
	(22) y,x,z+1/2 [\bar{v},\bar{u},\bar{w}]	(23) x-y, $\bar{y},z+1/2$ [$\bar{u}+v,v,\bar{w}$]	(24) $\bar{x},\bar{x}+y,z+1/2$ [u,u-v, \bar{w}]
12 f m'..	x,y,0 [u,v,0]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},0$ [u,v,0]	$y,\bar{x}+y,0$ [$\bar{v},u-v,0$]	x-y,x,0 [$\bar{u}+v,\bar{u},0$]
	y,x,1/2 [$\bar{v},\bar{u},0$]	x-y, $\bar{y},1/2$ [$\bar{u}+v,v,0$]	$\bar{x},\bar{x}+y,1/2$ [u,u-v,0]
	$\bar{y},\bar{x},1/2$ [$\bar{v},\bar{u},0$]	$\bar{x}+y,y,1/2$ [$\bar{u}+v,v,0$]	x,x-y,1/2 [u,u-v,0]
12 e ..2	x,2x,1/4 [u,2u,0]	2 $\bar{x},\bar{x},1/4$ [2 $\bar{u},\bar{u},0$]	x, $\bar{x},1/4$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},1/4$ [u,2u,0]	2x,x,1/4 [2 $\bar{u},\bar{u},0$]	$\bar{x},x,1/4$ [u, $\bar{u},0$]
	2x,x,3/4 [2 $\bar{u},\bar{u},0$]	$\bar{x},2\bar{x},3/4$ [u,2u,0]	$\bar{x},x,3/4$ [u, $\bar{u},0$]
	2 $\bar{x},\bar{x},3/4$ [2 $\bar{u},\bar{u},0$]	x,2x,3/4 [u,2u,0]	x, $\bar{x},3/4$ [u, $\bar{u},0$]

Continued

No. 74.6.384

 $p6'/m'c'c$

12 d	$.2'$	$x,0,1/4 [u,2u,w]$	$0,x,1/4 [2\bar{u},\bar{u},w]$	$\bar{x},\bar{x},1/4 [u,\bar{u},w]$
		$\bar{x},0,1/4 [u,2u,\bar{w}]$	$0,\bar{x},1/4 [2\bar{u},\bar{u},\bar{w}]$	$x,x,1/4 [u,\bar{u},\bar{w}]$
		$\bar{x},0,3/4 [u,2u,w]$	$0,\bar{x},3/4 [2\bar{u},\bar{u},w]$	$x,x,3/4 [u,\bar{u},w]$
		$x,0,3/4 [u,2u,\bar{w}]$	$0,x,3/4 [2\bar{u},\bar{u},\bar{w}]$	$\bar{x},\bar{x},3/4 [u,\bar{u},\bar{w}]$
4 c	$6'..$	$0,0,z [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$	
		$0,0,\bar{z} [0,0,0]$	$0,0,z+1/2 [0,0,0]$	
2 b	$6'/m'..$	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$	
2 a	$6'2'2$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$	

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $p2'm'm$	Along [210] $p_{2a^*}2'm'm$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

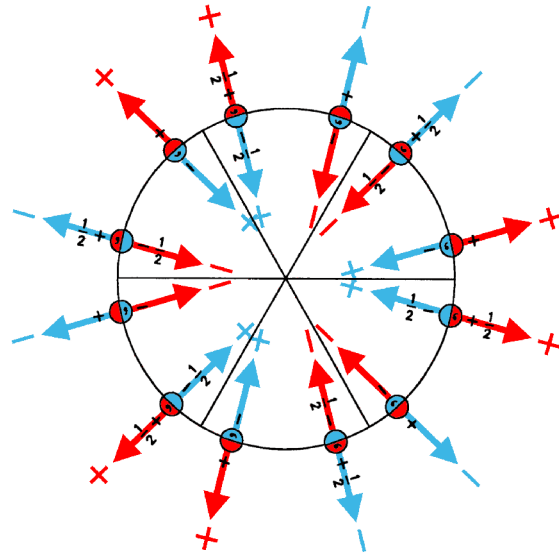
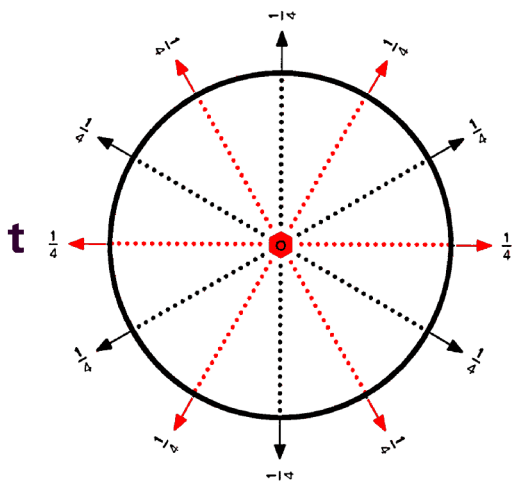
$p6'/mcc'$

$6'/mmm'$

Hexagonal

No. 74.7.385

$p6'/m2'/c2'/c'$



Origin at center ($6'/m$) at $6'/mcc'$

Asymmetric unit $0 \leq x$; $0 \leq y$; $0 \leq z \leq 1/4$; $y \leq x$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) $2'$ x,x,1/4
(2_{xy} 0,0,1/2)' | (8) $2'$ x,0,1/4
(2_x 0,0,1/2)' | (9) $2'$ 0,y,1/4
(2_y 0,0,1/2)' |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) c (0,0,1/2) x, \bar{x} ,z
(m_{xy} 0,0,1/2) | (20) c (0,0,1/2) x,2x,z
(m_x 0,0,1/2) | (21) c (0,0,1/2) 2x,x,z
(m_y 0,0,1/2) |
| (22) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (23) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (24) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 g 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [u,v, \bar{w}]	(5) $y,\bar{x}+y,z$ [$\bar{v},u-v,\bar{w}$]	(6) x-y,x,z [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) y,x, $\bar{z}+1/2$ [\bar{v},\bar{u},w]	(8) x-y, $\bar{y},\bar{z}+1/2$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}+1/2$ [u,u-v,w]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) x,x-y, $\bar{z}+1/2$ [u,u-v, \bar{w}]
	(13) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(14) $y,\bar{x}+y,\bar{z}$ [v, $\bar{u}+v,\bar{w}$]	(15) x-y,x, \bar{z} [u-v,u, \bar{w}]
	(16) x,y, \bar{z} [\bar{u},\bar{v},w]	(17) $\bar{y},x-y,\bar{z}$ [v, $\bar{u}+v,w$]	(18) $\bar{x}+y,\bar{x},\bar{z}$ [u-v,u,w]
	(19) $\bar{y},\bar{x},z+1/2$ [v,u, \bar{w}]	(20) $\bar{x}+y,y,z+1/2$ [u-v, \bar{v},\bar{w}]	(21) x,x-y,z+1/2 [$\bar{u},\bar{u}+v,\bar{w}$]
	(22) y,x,z+1/2 [v,u,w]	(23) x-y, $\bar{y},z+1/2$ [u-v, \bar{v},w]	(24) $\bar{x},\bar{x}+y,z+1/2$ [$\bar{u},\bar{u}+v,w$]
12 f m..	x,y,0 [0,0,w]	$\bar{y},x-y,0$ [0,0,w]	$\bar{x}+y,\bar{x},0$ [0,0,w]
	$\bar{x},\bar{y},0$ [0,0, \bar{w}]	y, $\bar{x}+y,0$ [0,0, \bar{w}]	x-y,x,0 [0,0, \bar{w}]
	y,x,1/2 [0,0,w]	x-y, $\bar{y},1/2$ [0,0,w]	$\bar{x},\bar{x}+y,1/2$ [0,0,w]
	$\bar{y},\bar{x},1/2$ [0,0, \bar{w}]	$\bar{x}+y,y,1/2$ [0,0, \bar{w}]	x,x-y,1/2 [0,0, \bar{w}]
12 e ..2	x,2x,1/4 [u,2u,0]	2 $\bar{x},\bar{x},1/4$ [2 $\bar{u},\bar{u},0$]	x, $\bar{x},1/4$ [u, $\bar{u},0$]
	$\bar{x},2\bar{x},1/4$ [u,2u,0]	2x,x,1/4 [2 $\bar{u},\bar{u},0$]	$\bar{x},x,1/4$ [u, $\bar{u},0$]
	2x,x,3/4 [2u,u,0]	$\bar{x},2\bar{x},3/4$ [$\bar{u},2\bar{u},0$]	$\bar{x},x,3/4$ [$\bar{u},u,0$]
	2 $\bar{x},\bar{x},3/4$ [2u,u,0]	x,2x,3/4 [$\bar{u},2\bar{u},0$]	x, $\bar{x},3/4$ [$\bar{u},u,0$]

Continued

No. 74.7.385

 $p6'/mcc'$

12 d $.2'$	$x,0,1/4 [u,2u,w]$	$0,x,1/4 [2\bar{u},\bar{u},w]$	$\bar{x},\bar{x},1/4 [u,\bar{u},w]$
	$\bar{x},0,1/4 [u,2u,\bar{w}]$	$0,\bar{x},1/4 [2\bar{u},\bar{u},\bar{w}]$	$x,x,1/4 [u,\bar{u},\bar{w}]$
	$\bar{x},0,3/4 [\bar{u},2\bar{u},\bar{w}]$	$0,\bar{x},3/4 [2u,u,\bar{w}]$	$x,x,3/4 [\bar{u},u,\bar{w}]$
	$x,0,3/4 [\bar{u},2\bar{u},w]$	$0,x,3/4 [2u,u,w]$	$\bar{x},\bar{x},3/4 [\bar{u},u,w]$
4 c $6'..$	$0,0,z [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$	
	$0,0,\bar{z} [0,0,0]$	$0,0,z+1/2 [0,0,0]$	
2 b $6'/m..$	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$	
2 a $6'2'2$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$	

Symmetry of special projections

Along [001] $6'mm'$	Along [100] $p_{2a^*}2mm$	Along [210] $p2mm$
Origin at 0,0,z	$a^* = c/2$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

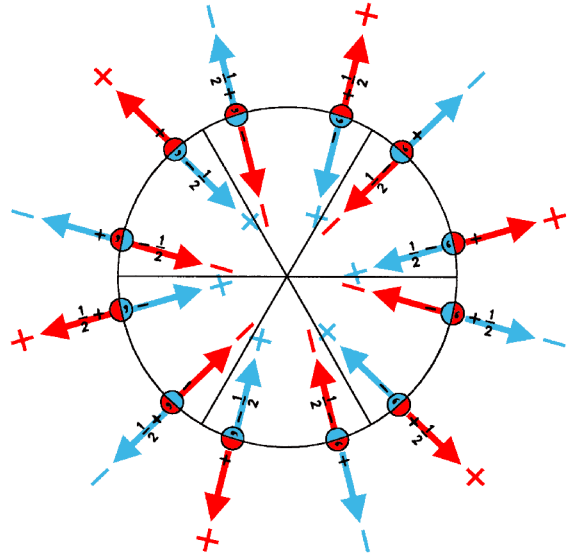
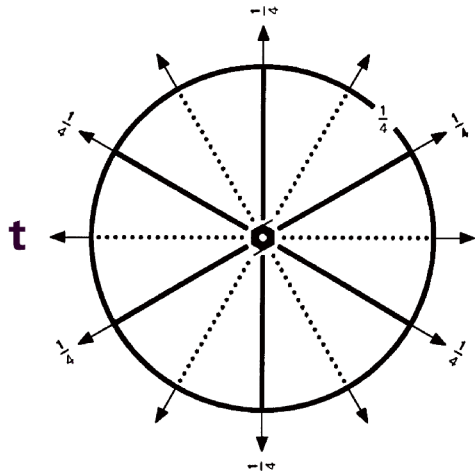
$p6_3/mmc$

$6/mmm$

Hexagonal

No. 75.1.386

$p6_3/m2/m2/c$



Origin at center ($\bar{3}m1$) at $\bar{3}2/mc$

Asymmetric unit $y \leq x/2$; $y \geq -x$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,1/4
(m_z 0,0,1/2) | (17) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2) | (18) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2) |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (23) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (24) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z+1/2 [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z+1/2 [v,\bar{u}+v,w]$	(6) $x-y,x,z+1/2 [u-v,u,w]$
	(7) $y,x,\bar{z} [v,u,\bar{w}]$	(8) $x-y,\bar{y},\bar{z} [u-v,\bar{v},\bar{w}]$	(9) $\bar{x},\bar{x}+y,\bar{z} [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $\bar{y},\bar{x},\bar{z}+1/2 [\bar{v},\bar{u},\bar{w}]$	(11) $\bar{x}+y,y,\bar{z}+1/2 [\bar{u}+v,v,\bar{w}]$	(12) $x,x-y,\bar{z}+1/2 [u,u-v,\bar{w}]$
	(13) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(14) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$	(15) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$
	(16) $x,y,\bar{z}+1/2 [\bar{u},\bar{v},w]$	(17) $\bar{y},x-y,\bar{z}+1/2 [v,\bar{u}+v,w]$	(18) $\bar{x}+y,\bar{x},\bar{z}+1/2 [u-v,u,w]$
	(19) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(20) $\bar{x}+y,y,z [u-v,\bar{v},\bar{w}]$	(21) $x,x-y,z [\bar{u},\bar{u}+v,\bar{w}]$
	(22) $y,x,z+1/2 [\bar{v},\bar{u},\bar{w}]$	(23) $x-y,\bar{y},z+1/2 [\bar{u}+v,v,\bar{w}]$	(24) $\bar{x},\bar{x}+y,z+1/2 [u,u-v,\bar{w}]$
12 g .m.	$x,2x,z [u,0,0]$	$2\bar{x},\bar{x},z [0,u,0]$	$x,\bar{x},z [\bar{u},\bar{u},0]$
	$\bar{x},2\bar{x},z+1/2 [\bar{u},0,0]$	$2x,x,z+1/2 [0,\bar{u},0]$	$\bar{x},x,z+1/2 [u,u,0]$
	$2x,x,\bar{z} [0,u,0]$	$\bar{x},2\bar{x},\bar{z} [u,0,0]$	$\bar{x},x,\bar{z} [\bar{u},\bar{u},0]$
	$2\bar{x},\bar{x},\bar{z}+1/2 [0,\bar{u},0]$	$x,2x,\bar{z}+1/2 [\bar{u},0,0]$	$x,\bar{x},\bar{z}+1/2 [\bar{u},\bar{u},0]$
12 f m..	$x,y,1/4 [0,0,w]$	$\bar{y},x-y,1/4 [0,0,w]$	$\bar{x}+y,\bar{x},1/4 [0,0,w]$
	$\bar{x},\bar{y},3/4 [0,0,w]$	$y,\bar{x}+y,3/4 [0,0,w]$	$x-y,x,3/4 [0,0,w]$
	$y,x,3/4 [0,0,\bar{w}]$	$x-y,\bar{y},3/4 [0,0,\bar{w}]$	$\bar{x},\bar{x}+y,3/4 [0,0,\bar{w}]$
	$\bar{y},\bar{x},1/4 [0,0,\bar{w}]$	$\bar{x}+y,y,1/4 [0,0,\bar{w}]$	$x,x-y,1/4 [0,0,\bar{w}]$

Continued

No. 75.1.386

 $p6_3/mmc$

12 e .2.	$x,0,0 [u,0,0]$	$0,x,0 [0,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$
	$\bar{x},0,1/2 [\bar{u},0,0]$	$0,\bar{x},1/2 [0,\bar{u},0]$	$x,x,1/2 [u,u,0]$
	$\bar{x},0,0 [u,0,0]$	$0,\bar{x},0 [0,u,0]$	$x,x,0 [\bar{u},\bar{u},0]$
	$x,0,1/2 [\bar{u},0,0]$	$0,x,1/2 [0,\bar{u},0]$	$\bar{x},\bar{x},1/2 [u,u,0]$
6 d mm_2	$x,2x,1/4 [0,0,0]$	$2\bar{x},\bar{x},1/4 [0,0,0]$	$x,\bar{x},1/4 [0,0,0]$
	$\bar{x},2\bar{x},3/4 [0,0,0]$	$2x,x,3/4 [0,0,0]$	$\bar{x},x,3/4 [0,0,0]$
4 c $3m$.	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$	
	$0,0,\bar{z} [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$	
2 b $\bar{6}m_2$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$	
2 a $\bar{3}m$.	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$	

Symmetry of special projections

Along [001] $6mm$ Origin at $0,0,z$ Along [100] $p2mg1'$ $a^* = c$ Origin at $x,0,0$ Along [210] $p_{2a^*}2'm'm$ $a^* = c/2$ Origin at $x,x/2,0$

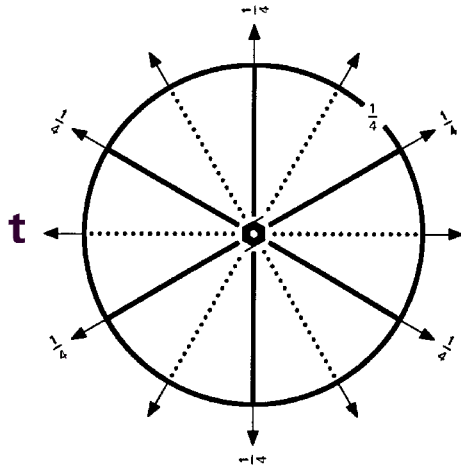
$p6_3/mmc1'$

$6/mmm1'$

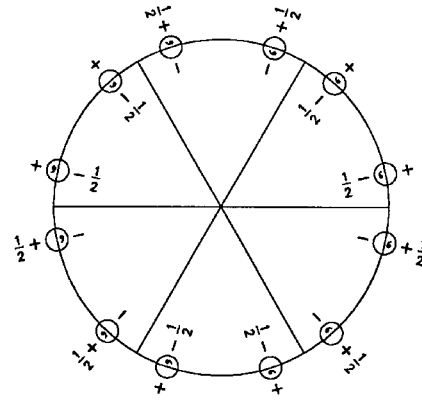
Hexagonal

No. 75.2.387

$p6_3/m2/m2/c1'$



1'



Origin at center ($\bar{3}m11'$) at $\bar{3}2/mc1'$

Asymmetric unit $y \leq x/2$; $y \geq -x$; $0 \leq z \leq 1/4$

Symmetry operations

For 1 + set

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,1/4
(m_z 0,0,1/2) | (17) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2) | (18) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2) |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (23) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (24) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

For 1' + set

$$(1) 1' \\ (1|0,0,0)'$$

$$(4) 2' (0,0,1/2) \quad 0,0,z \\ (2_z|0,0,1/2)'$$

$$(7) 2' \quad x,x,0 \\ (2_{xy}|0,0,0)'$$

$$(10) 2' \quad x,\bar{x},1/4 \\ (2_3|0,0,1/2)'$$

$$(13) \bar{1}' \quad 0,0,0 \\ (\bar{1}|0,0,0)'$$

$$(16) m' \quad x,y,1/4 \\ (m_2|0,0,1/2)'$$

$$(19) m' \quad x,\bar{x},z \\ (m_{xy}|0,0,0)'$$

$$(22) c' (0,0,1/2) \quad x,x,z \\ (m_3|0,0,1/2)'$$

$$(2) 3^{+'} \quad 0,0,z \\ (3_z|0,0,0)'$$

$$(5) 6^{-'} (0,0,1/2) \quad 0,0,z \\ (6_z^{-1}|0,0,1/2)'$$

$$(8) 2' \quad x,0,0 \\ (2_x|0,0,0)'$$

$$(11) 2' \quad x,2x,1/4 \\ (2_2|0,0,1/2)'$$

$$(14) \bar{3}^{+'} \quad 0,0,z; 0,0,0 \\ (\bar{3}_z|0,0,0)'$$

$$(17) \bar{6}^{-'} \quad 0,0,z; 0,0,1/4 \\ (\bar{6}_z^{-1}|0,0,1/2)'$$

$$(20) m' \quad x,2x,z \\ (m_x|0,0,0)'$$

$$(23) c' (0,0,1/2) \quad x,0,z \\ (m_2|0,0,1/2)'$$

$$(3) 3^{-'} \quad 0,0,z \\ (3_z^{-1}|0,0,0)'$$

$$(6) 6^{+'} (0,0,1/2) \quad 0,0,z \\ (6_z|0,0,1/2)'$$

$$(9) 2' \quad 0,y,0 \\ (2_y|0,0,0)'$$

$$(12) 2' \quad 2x,x,1/4 \\ (2_1|0,0,1/2)'$$

$$(15) \bar{3}^{-'} \quad 0,0,z; 0,0,0 \\ (\bar{3}_z^{-1}|0,0,0)'$$

$$(18) \bar{6}^{+'} \quad 0,0,z; 0,0,1/4 \\ (\bar{6}_z|0,0,1/2)'$$

$$(21) m' \quad 2x,x,z \\ (m_y|0,0,0)'$$

$$(24) c' (0,0,1/2) \quad 0,y,z \\ (m_1|0,0,1/2)'$$

Generators selected (1); $t(0,0,1)$; (2); (4); (7); (13); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
		1+	1' +
24 h 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $\bar{x},\bar{y},z+1/2 [0,0,0]$	(5) $y,\bar{x}+y,z+1/2 [0,0,0]$	(6) $x-y,x,z+1/2 [0,0,0]$
	(7) $y,x,\bar{z} [0,0,0]$	(8) $x-y,\bar{y},\bar{z} [0,0,0]$	(9) $\bar{x},\bar{x}+y,\bar{z} [0,0,0]$
	(10) $\bar{y},\bar{x},\bar{z}+1/2 [0,0,0]$	(11) $\bar{x}+y,y,\bar{z}+1/2 [0,0,0]$	(12) $x,x-y,\bar{z}+1/2 [0,0,0]$
	(13) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(14) $y,\bar{x}+y,\bar{z} [0,0,0]$	(15) $x-y,x,\bar{z} [0,0,0]$
	(16) $x,y,\bar{z}+1/2 [0,0,0]$	(17) $\bar{y},x-y,\bar{z}+1/2 [0,0,0]$	(18) $\bar{x}+y,\bar{x},\bar{z}+1/2 [0,0,0]$
	(19) $\bar{y},\bar{x},z [0,0,0]$	(20) $\bar{x}+y,y,z [0,0,0]$	(21) $x,x-y,z [0,0,0]$
	(22) $y,x,z+1/2 [0,0,0]$	(23) $x-y,\bar{y},z+1/2 [0,0,0]$	(24) $\bar{x},\bar{x}+y,z+1/2 [0,0,0]$
12 g .m.1'	$x,2x,z [0,0,0]$	$2\bar{x},\bar{x},z [0,0,0]$	$x,\bar{x},z [0,0,0]$
	$\bar{x},2\bar{x},z+1/2 [0,0,0]$	$2x,x,z+1/2 [0,0,0]$	$\bar{x},x,z+1/2 [0,0,0]$
	$2x,x,\bar{z} [0,0,0]$	$\bar{x},2\bar{x},\bar{z} [0,0,0]$	$\bar{x},x,\bar{z} [0,0,0]$
	$2\bar{x},\bar{x},\bar{z}+1/2 [0,0,0]$	$x,2x,\bar{z}+1/2 [0,0,0]$	$x,\bar{x},\bar{z}+1/2 [0,0,0]$
12 f m..1'	$x,y,1/4 [0,0,0]$	$\bar{y},x-y,1/4 [0,0,0]$	$\bar{x}+y,\bar{x},1/4 [0,0,0]$
	$\bar{x},\bar{y},3/4 [0,0,0]$	$y,\bar{x}+y,3/4 [0,0,0]$	$x-y,x,3/4 [0,0,0]$
	$y,x,3/4 [0,0,0]$	$x-y,\bar{y},3/4 [0,0,0]$	$\bar{x},\bar{x}+y,3/4 [0,0,0]$
	$\bar{y},\bar{x},1/4 [0,0,0]$	$\bar{x}+y,y,1/4 [0,0,0]$	$x,x-y,1/4 [0,0,0]$

Continued

No. 75.2.387

 $p6_3/mmc1'$

12 e .2.1'	$x,0,0 [0,0,0]$	$0,x,0 [0,0,0]$	$\bar{x},\bar{x},0 [0,0,0]$
	$\bar{x},0,1/2 [0,0,0]$	$0,\bar{x},1/2 [0,0,0]$	$x,x,1/2 [0,0,0]$
	$\bar{x},0,0 [0,0,0]$	$0,\bar{x},0 [0,0,0]$	$x,x,0 [0,0,0]$
	$x,0,1/2 [0,0,0]$	$0,x,1/2 [0,0,0]$	$\bar{x},\bar{x},1/2 [0,0,0]$
6 d $\bar{m}m21'$	$x,2x,1/4 [0,0,0]$	$2\bar{x},\bar{x},1/4 [0,0,0]$	$x,\bar{x},1/4 [0,0,0]$
	$\bar{x},2\bar{x},3/4 [0,0,0]$	$2x,x,3/4 [0,0,0]$	$\bar{x},x,3/4 [0,0,0]$
4 c $3m.1'$	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$	
	$0,0,\bar{z} [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$	
2 b $\bar{6}m21'$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$	
2 a $\bar{3}m.1'$	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$	

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $p2mg1'$	Along [210] $p2mm1'$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c/2$ Origin at $x,x/2,0$

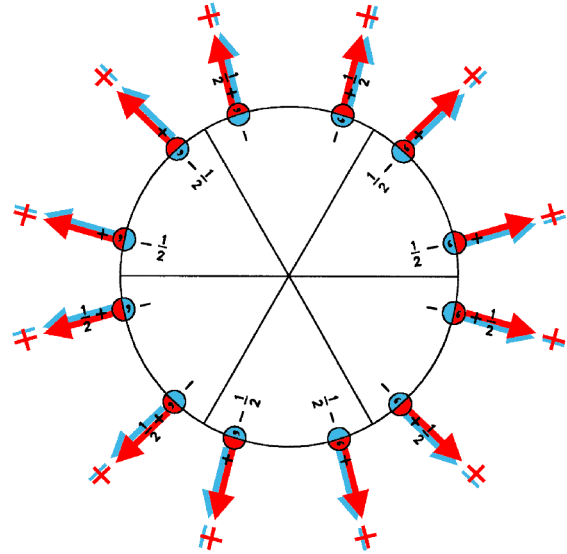
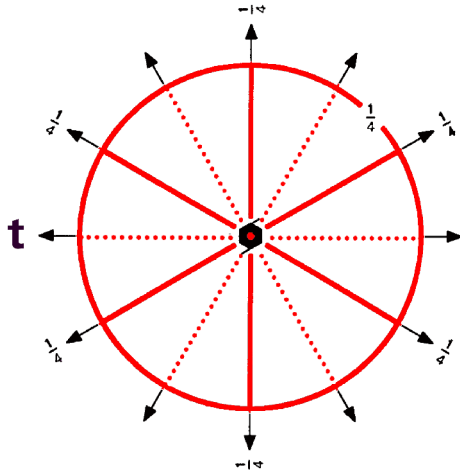
$p6_3/m'm'c'$

$6/m'm'm'$

Hexagonal

No. 75.3.388

$p6_3/m'2/m'2/c'$



Origin at center ($\bar{3}'m'1$) at $\bar{3}'2/m'c'$

Asymmetric unit $y \leq x/2$; $y \geq -x$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|--|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m' x,y,1/4
(m_z 0,0,1/2)' | (17) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2)' | (18) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2)' |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (23) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (24) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 h 1	(1) x,y,z $[u,v,w]$	(2) $\bar{y},x-y,z$ $[\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z$ $[\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z+1/2$ $[\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z+1/2$ $[v,\bar{u}+v,w]$	(6) $x-y,x,z+1/2$ $[u-v,u,w]$
	(7) y,x,\bar{z} $[v,u,\bar{w}]$	(8) $x-y,\bar{y},\bar{z}$ $[u-v,\bar{v},\bar{w}]$	(9) $\bar{x},\bar{x}+y,\bar{z}$ $[\bar{u},\bar{u}+v,\bar{w}]$
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ $[\bar{v},\bar{u},\bar{w}]$	(11) $\bar{x}+y,y,\bar{z}+1/2$ $[\bar{u}+v,v,\bar{w}]$	(12) $x,x-y,\bar{z}+1/2$ $[u,u-v,\bar{w}]$
	(13) \bar{x},\bar{y},\bar{z} $[\bar{u},\bar{v},\bar{w}]$	(14) $y,\bar{x}+y,\bar{z}$ $[v,\bar{u}+v,\bar{w}]$	(15) $x-y,x,\bar{z}$ $[u-v,u,\bar{w}]$
	(16) $x,y,\bar{z}+1/2$ $[u,v,\bar{w}]$	(17) $\bar{y},x-y,\bar{z}+1/2$ $[\bar{v},u-v,\bar{w}]$	(18) $\bar{x}+y,\bar{x},\bar{z}+1/2$ $[\bar{u}+v,\bar{u},\bar{w}]$
	(19) \bar{y},\bar{x},z $[\bar{v},\bar{u},w]$	(20) $\bar{x}+y,y,z$ $[\bar{u}+v,v,w]$	(21) $x,x-y,z$ $[u,u-v,w]$
	(22) $y,x,z+1/2$ $[v,u,w]$	(23) $x-y,\bar{y},z+1/2$ $[u-v,\bar{v},w]$	(24) $\bar{x},\bar{x}+y,z+1/2$ $[\bar{u},\bar{u}+v,w]$
12 g .m'	$x,2x,z$ $[u,2u,w]$	$2\bar{x},\bar{x},z$ $[2\bar{u},\bar{u},w]$	x,\bar{x},z $[u,\bar{u},w]$
	$\bar{x},2\bar{x},z+1/2$ $[\bar{u},2\bar{u},w]$	$2x,x,z+1/2$ $[2u,u,w]$	$\bar{x},x,z+1/2$ $[\bar{u},u,w]$
	$2x,x,\bar{z}$ $[2u,u,\bar{w}]$	$\bar{x},2\bar{x},\bar{z}$ $[\bar{u},2\bar{u},\bar{w}]$	\bar{x},x,\bar{z} $[\bar{u},u,\bar{w}]$
	$2\bar{x},\bar{x},\bar{z}+1/2$ $[2\bar{u},\bar{u},\bar{w}]$	$x,2x,\bar{z}+1/2$ $[u,2u,\bar{w}]$	$x,\bar{x},\bar{z}+1/2$ $[u,\bar{u},\bar{w}]$
12 f m'.	$x,y,1/4$ $[u,v,0]$	$\bar{y},x-y,1/4$ $[\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},1/4$ $[\bar{u}+v,\bar{u},0]$
	$\bar{x},\bar{y},3/4$ $[\bar{u},\bar{v},0]$	$y,\bar{x}+y,3/4$ $[v,\bar{u}+v,0]$	$x-y,x,3/4$ $[u-v,u,0]$
	$y,x,3/4$ $[v,u,0]$	$x-y,\bar{y},3/4$ $[u-v,\bar{v},0]$	$\bar{x},\bar{x}+y,3/4$ $[\bar{u},\bar{u}+v,0]$
	$\bar{y},\bar{x},1/4$ $[\bar{v},\bar{u},0]$	$\bar{x}+y,y,1/4$ $[\bar{u}+v,v,0]$	$x,x-y,1/4$ $[u,u-v,0]$

Continued

No. 75.3.388

 $p6_3/m'm'c'$

12 e .2.	$x,0,0 [u,0,0]$	$0,x,0 [0,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$
	$\bar{x},0,1/2 [\bar{u},0,0]$	$0,\bar{x},1/2 [0,\bar{u},0]$	$x,x,1/2 [u,u,0]$
	$\bar{x},0,0 [\bar{u},0,0]$	$0,\bar{x},0 [0,\bar{u},0]$	$x,x,0 [u,u,0]$
	$x,0,1/2 [u,0,0]$	$0,x,1/2 [0,u,0]$	$\bar{x},\bar{x},1/2 [\bar{u},\bar{u},0]$
6 d $\bar{6}m'2$	$x,2x,1/4 [u,2u,0]$	$2\bar{x},\bar{x},1/4 [2\bar{u},\bar{u},0]$	$x,\bar{x},1/4 [u,\bar{u},0]$
	$\bar{x},2\bar{x},3/4 [\bar{u},2\bar{u},0]$	$2x,x,3/4 [2u,u,0]$	$\bar{x},x,3/4 [\bar{u},u,0]$
4 c $3m'$	$0,0,z [0,0,w]$	$0,0,z+1/2 [0,0,w]$	
	$0,0,\bar{z} [0,0,\bar{w}]$	$0,0,\bar{z}+1/2 [0,0,\bar{w}]$	
2 b $\bar{6}m'2$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$	
2 a $\bar{3}m'$	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$	

Symmetry of special projections

Along [001] $6m'm'$	Along [100] $p2'mg'$	Along [210] $p2'mm'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

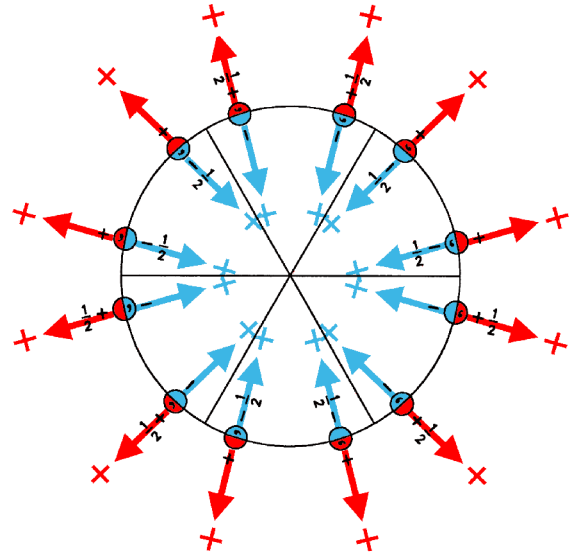
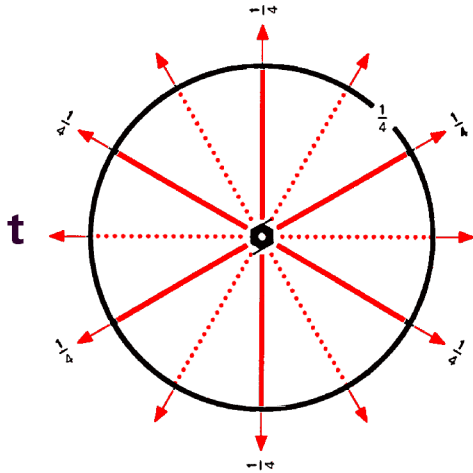
$p6_3/mm'c'$

$6/mm'm'$

Hexagonal

No. 75.4.389

$p6_3/m2'/m'2'/c'$



Origin at center ($\bar{3}m'1$) at $\bar{3}2'/m'c'$

Asymmetric unit $y \leq x/2$; $y \geq -x$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (12) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,1/4
(m_z 0,0,1/2) | (17) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2) | (18) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2) |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (23) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (24) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/2$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/2$ [$u-v,u,w$]
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [$u,u-v,w$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$u-v,\bar{v},w$]	(12) $x,x-y,\bar{z}+1/2$ [$\bar{u},\bar{u}+v,w$]
	(13) \bar{x},\bar{y},\bar{z} [u,v,w]	(14) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(15) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]
	(16) $x,y,\bar{z}+1/2$ [\bar{u},\bar{v},w]	(17) $\bar{y},x-y,\bar{z}+1/2$ [$v,\bar{u}+v,w$]	(18) $\bar{x}+y,\bar{x},\bar{z}+1/2$ [$u-v,u,w$]
	(19) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(20) $\bar{x}+y,y,z$ [$\bar{u}+v,v,w$]	(21) $x,x-y,z$ [$u,u-v,w$]
	(22) $y,x,z+1/2$ [v,u,w]	(23) $x-y,\bar{y},z+1/2$ [$u-v,\bar{v},w$]	(24) $\bar{x},\bar{x}+y,z+1/2$ [$\bar{u},\bar{u}+v,w$]
12 g .m'	$x,2x,z$ [$u,2u,w$]	$2\bar{x},\bar{x},z$ [$2\bar{u},\bar{u},w$]	x,\bar{x},z [u,\bar{u},w]
	$\bar{x},2\bar{x},z+1/2$ [$\bar{u},2\bar{u},w$]	$2x,x,z+1/2$ [$2u,u,w$]	$\bar{x},x,z+1/2$ [\bar{u},u,w]
	$2x,x,\bar{z}$ [$2\bar{u},\bar{u},w$]	$\bar{x},2\bar{x},\bar{z}$ [$u,2u,w$]	\bar{x},x,\bar{z} [u,\bar{u},w]
	$2\bar{x},\bar{x},\bar{z}+1/2$ [$2u,u,w$]	$x,2x,\bar{z}+1/2$ [$\bar{u},2\bar{u},w$]	$x,\bar{x},\bar{z}+1/2$ [\bar{u},u,w]
12 f m..	$x,y,1/4$ [$0,0,w$]	$\bar{y},x-y,1/4$ [$0,0,w$]	$\bar{x}+y,\bar{x},1/4$ [$0,0,w$]
	$\bar{x},\bar{y},3/4$ [$0,0,w$]	$y,\bar{x}+y,3/4$ [$0,0,w$]	$x-y,x,3/4$ [$0,0,w$]
	$y,x,3/4$ [$0,0,w$]	$x-y,\bar{y},3/4$ [$0,0,w$]	$\bar{x},\bar{x}+y,3/4$ [$0,0,w$]
	$\bar{y},\bar{x},1/4$ [$0,0,w$]	$\bar{x}+y,y,1/4$ [$0,0,w$]	$x,x-y,1/4$ [$0,0,w$]

Continued

No. 75.4.389

 $p6_3/mm'c'$

12 e .2'	$x,0,0 [u,2u,w]$	$0,x,0 [2\bar{u},\bar{u},w]$	$\bar{x},\bar{x},0 [u,\bar{u},w]$
	$\bar{x},0,1/2 [\bar{u},2\bar{u},w]$	$0,\bar{x},1/2 [2u,u,w]$	$x,x,1/2 [\bar{u},u,w]$
	$\bar{x},0,0 [u,2u,w]$	$0,\bar{x},0 [2\bar{u},\bar{u},w]$	$x,x,0 [u,\bar{u},w]$
	$x,0,1/2 [\bar{u},2\bar{u},w]$	$0,x,1/2 [2u,u,w]$	$\bar{x},\bar{x},1/2 [\bar{u},u,w]$
6 d $\bar{6}m'2'$	$x,2x,1/4 [0,0,w]$	$2\bar{x},\bar{x},1/4 [0,0,w]$	$x,\bar{x},1/4 [0,0,w]$
	$\bar{x},2\bar{x},3/4 [0,0,w]$	$2x,x,3/4 [0,0,w]$	$\bar{x},x,3/4 [0,0,w]$
4 c $3m'$	$0,0,z [0,0,w]$	$0,0,z+1/2 [0,0,w]$	
	$0,0,\bar{z} [0,0,w]$	$0,0,\bar{z}+1/2 [0,0,w]$	
2 b $\bar{6}m'2'$	$0,0,1/4 [0,0,w]$	$0,0,3/4 [0,0,w]$	
2 a $\bar{3}m'$	$0,0,0 [0,0,w]$	$0,0,1/2 [0,0,w]$	

Symmetry of special projections

Along [001] $\bar{6}m'm'$	Along [100] $p2'mg'$	Along [210] $p2'mm'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

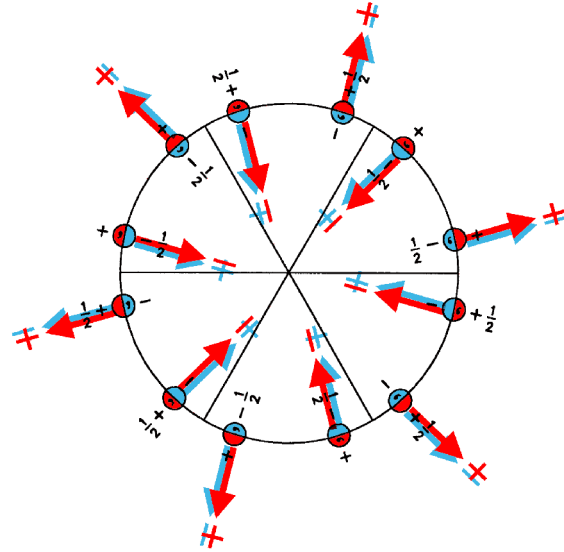
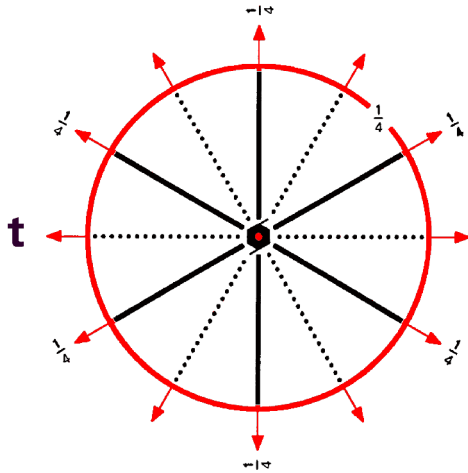
$p6_3/m'mc$

$6/m'mm$

Hexagonal

No. 75.5.390

$p6_3/m^2/m2'/c$



Origin at center ($\bar{3}'m1$) at $\bar{3}'2'/mc$

Asymmetric unit $y \leq x/2$; $y \geq -x$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 (0,0,1/2) 0,0,z
(2_z 0,0,1/2) | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2) | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2) |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (12) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m' x,y,1/4
(m_z 0,0,1/2)' | (17) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2)' | (18) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2)' |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (23) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (24) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z+1/2$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z+1/2$ [$u-v,u,w$]
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [$u,u-v,w$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$u-v,\bar{v},w$]	(12) $x,x-y,\bar{z}+1/2$ [$\bar{u},\bar{u}+v,w$]
	(13) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(14) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(15) $x-y,x,\bar{z}$ [$u-v,u,\bar{w}$]
	(16) $x,y,\bar{z}+1/2$ [u,v,\bar{w}]	(17) $\bar{y},x-y,\bar{z}+1/2$ [$\bar{v},u-v,\bar{w}$]	(18) $\bar{x}+y,\bar{x},\bar{z}+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(19) \bar{y},\bar{x},z [v,u,\bar{w}]	(20) $\bar{x}+y,y,z$ [$u-v,\bar{v},\bar{w}$]	(21) $x,x-y,z$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(22) $y,x,z+1/2$ [\bar{v},\bar{u},\bar{w}]	(23) $x-y,\bar{y},z+1/2$ [$\bar{u}+v,v,\bar{w}$]	(24) $\bar{x},\bar{x}+y,z+1/2$ [$u,u-v,\bar{w}$]
12 g .m.	$x,2x,z$ [$u,0,0$]	$2\bar{x},\bar{x},z$ [$0,u,0$]	x,\bar{x},z [$\bar{u},\bar{u},0$]
	$\bar{x},2\bar{x},z+1/2$ [$\bar{u},0,0$]	$2x,x,z+1/2$ [$0,\bar{u},0$]	$\bar{x},x,z+1/2$ [$u,u,0$]
	$2x,x,\bar{z}$ [$0,\bar{u},0$]	$\bar{x},2\bar{x},\bar{z}$ [$\bar{u},0,0$]	\bar{x},x,\bar{z} [$u,u,0$]
	$2\bar{x},\bar{x},\bar{z}+1/2$ [$0,u,0$]	$x,2x,\bar{z}+1/2$ [$u,0,0$]	$x,\bar{x},\bar{z}+1/2$ [$\bar{u},\bar{u},0$]
12 f m'..	$x,y,1/4$ [$u,v,0$]	$\bar{y},x-y,1/4$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/4$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},3/4$ [$\bar{u},\bar{v},0$]	$y,\bar{x}+y,3/4$ [$v,\bar{u}+v,0$]	$x-y,x,3/4$ [$u-v,u,0$]
	$y,x,3/4$ [$\bar{v},\bar{u},0$]	$x-y,\bar{y},3/4$ [$\bar{u}+v,v,0$]	$\bar{x},\bar{x}+y,3/4$ [$u,u-v,0$]
	$\bar{y},\bar{x},1/4$ [$v,u,0$]	$\bar{x}+y,y,1/4$ [$u-v,\bar{v},0$]	$x,x-y,1/4$ [$\bar{u},\bar{u}+v,0$]

Continued

No. 75.5.390

 $\rho 6_3/m'mc$

12 e .2'	$x,0,0 [u,2u,w]$	$0,x,0 [2\bar{u},\bar{u},w]$	$\bar{x},\bar{x},0 [u,\bar{u},w]$
	$\bar{x},0,1/2 [\bar{u},2\bar{u},w]$	$0,\bar{x},1/2 [2u,u,w]$	$x,x,1/2 [\bar{u},u,w]$
	$\bar{x},0,0 [\bar{u},2\bar{u},\bar{w}]$	$0,\bar{x},0 [2u,u,\bar{w}]$	$x,x,0 [\bar{u},u,\bar{w}]$
	$x,0,1/2 [u,2u,\bar{w}]$	$0,x,1/2 [2\bar{u},\bar{u},\bar{w}]$	$\bar{x},\bar{x},1/2 [u,\bar{u},\bar{w}]$
6 d $m'm2'$	$x,2x,1/4 [u,0,0]$	$2\bar{x},\bar{x},1/4 [0,u,0]$	$x,\bar{x},1/4 [\bar{u},\bar{u},0]$
	$\bar{x},2\bar{x},3/4 [\bar{u},0,0]$	$2x,x,3/4 [0,\bar{u},0]$	$\bar{x},x,3/4 [u,u,0]$
4 c $3m.$	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$	
	$0,0,\bar{z} [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$	
2 b $\bar{6}'m2'$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$	
2 a $\bar{3}'m.$	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$	

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $\rho 2mg1'$	Along [210] $\rho_{2a^*}2mm$
Origin at $0,0,z$	$a^* = c$ Origin at $x,0,0$	$a^* = c/2$ Origin at $x,x/2,0$

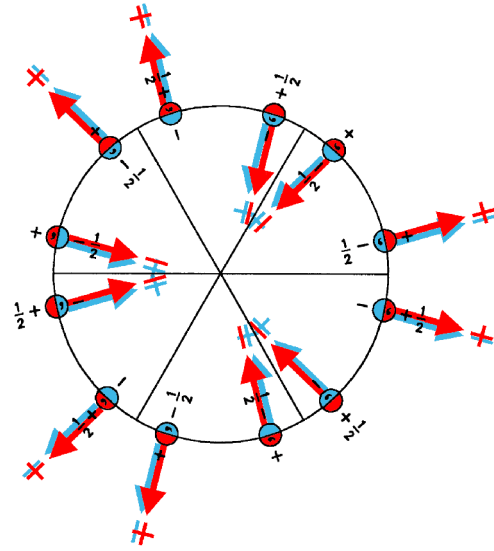
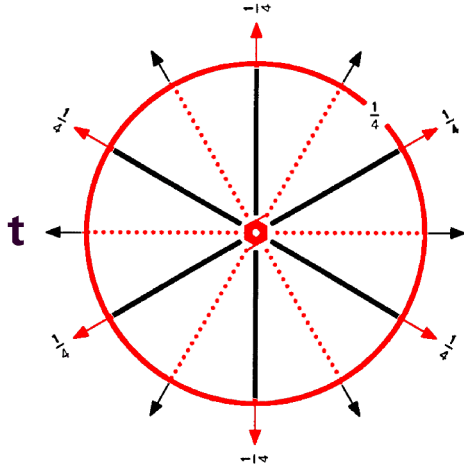
$\rho 6_3'/m'c'$

$6'/m'mm'$

Hexagonal

No. 75.6.391

$\rho 6_3'/m'2/m2'/c'$



Origin at center ($\bar{3}m1$) at $\bar{3}2/mc'$

Asymmetric unit $y \leq x/2$; $y \geq -x$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (12) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m' x,y,1/4
(m_z 0,0,1/2)' | (17) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2)' | (18) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2)' |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (23) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (24) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	(5) $y,\bar{x}+y,z+1/2$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) y,x,\bar{z} [v,u, \bar{w}]	(8) $x-y,\bar{y},\bar{z}$ [u-v, \bar{v},\bar{w}]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [v,u,w]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [u-v, \bar{v},w]	(12) $x,x-y,\bar{z}+1/2$ [$\bar{u},\bar{u}+v,w$]
	(13) \bar{x},\bar{y},\bar{z} [u,v,w]	(14) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(15) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]
	(16) $x,y,\bar{z}+1/2$ [u,v, \bar{w}]	(17) $\bar{y},x-y,\bar{z}+1/2$ [$\bar{v},u-v,\bar{w}$]	(18) $\bar{x}+y,\bar{x},\bar{z}+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(19) \bar{y},\bar{x},z [v,u, \bar{w}]	(20) $\bar{x}+y,y,z$ [u-v, \bar{v},\bar{w}]	(21) $x,x-y,z$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(22) $y,x,z+1/2$ [v,u,w]	(23) $x-y,\bar{y},z+1/2$ [u-v, \bar{v},w]	(24) $\bar{x},\bar{x}+y,z+1/2$ [$\bar{u},\bar{u}+v,w$]
12 g .m.	$x,2x,z$ [u,0,0]	$2\bar{x},\bar{x},z$ [0,u,0]	x,\bar{x},z [$\bar{u},\bar{u},0$]
	$\bar{x},2\bar{x},z+1/2$ [u,0,0]	$2x,x,z+1/2$ [0,u,0]	$\bar{x},x,z+1/2$ [$\bar{u},\bar{u},0$]
	$2x,x,\bar{z}$ [0,u,0]	$\bar{x},2\bar{x},\bar{z}$ [u,0,0]	\bar{x},x,\bar{z} [$\bar{u},\bar{u},0$]
	$2\bar{x},\bar{x},\bar{z}+1/2$ [0,u,0]	$x,2x,\bar{z}+1/2$ [u,0,0]	$x,\bar{x},\bar{z}+1/2$ [$\bar{u},\bar{u},0$]
12 f m'..	$x,y,1/4$ [u,v,0]	$\bar{y},x-y,1/4$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/4$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},3/4$ [u,v,0]	$y,\bar{x}+y,3/4$ [$\bar{v},u-v,0$]	$x-y,x,3/4$ [$\bar{u}+v,\bar{u},0$]
	$y,x,3/4$ [v,u,0]	$x-y,\bar{y},3/4$ [u-v, $\bar{v},0$]	$\bar{x},\bar{x}+y,3/4$ [$\bar{u},\bar{u}+v,0$]
	$\bar{y},\bar{x},1/4$ [v,u,0]	$\bar{x}+y,y,1/4$ [u-v, $\bar{v},0$]	$x,x-y,1/4$ [$\bar{u},\bar{u}+v,0$]

Continued

No. 75.6.391

 $p6_3/m'mc'$

12 e .2.	$x,0,0 [u,0,0]$	$0,x,0 [0,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$
	$\bar{x},0,1/2 [u,0,0]$	$0,\bar{x},1/2 [0,u,0]$	$x,x,1/2 [\bar{u},\bar{u},0]$
	$\bar{x},0,0 [u,0,0]$	$0,\bar{x},0 [0,u,0]$	$x,x,0 [\bar{u},\bar{u},0]$
	$x,0,1/2 [u,0,0]$	$0,x,1/2 [0,u,0]$	$\bar{x},\bar{x},1/2 [\bar{u},\bar{u},0]$
6 d $m'm2'$	$x,2x,1/4 [u,0,0]$	$2\bar{x},\bar{x},1/4 [0,u,0]$	$x,\bar{x},1/4 [\bar{u},\bar{u},0]$
	$\bar{x},2\bar{x},3/4 [u,0,0]$	$2x,x,3/4 [0,u,0]$	$\bar{x},x,3/4 [\bar{u},\bar{u},0]$
4 c $3m.$	$0,0,z [0,0,0]$	$0,0,z+1/2 [0,0,0]$	
	$0,0,\bar{z} [0,0,0]$	$0,0,\bar{z}+1/2 [0,0,0]$	
2 b $\bar{6}'m2'$	$0,0,1/4 [0,0,0]$	$0,0,3/4 [0,0,0]$	
2 a $\bar{3}m.$	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$	

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $p2mg1'$	Along [210] $p2'm'm$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

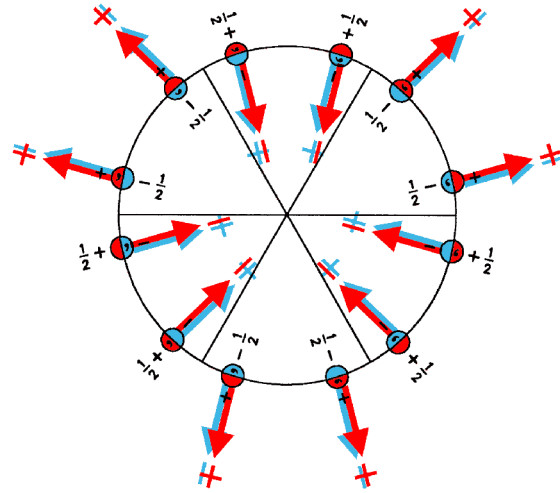
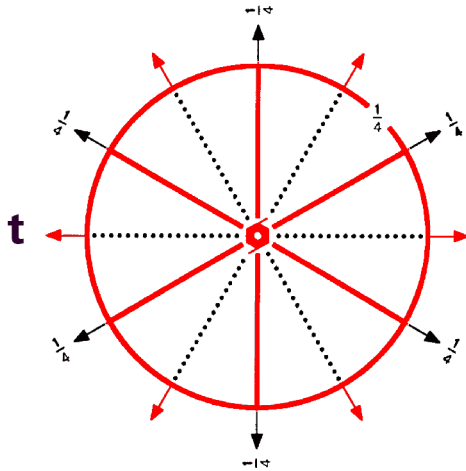
$p6_3'/m'm'c$

$6'/m'm'm$

Hexagonal

No. 75.7.392

$p6_3'/m'2'/m'2'/c$



Origin at center ($\bar{3}m'1$) at $\bar{3}2'/m'c$

Asymmetric unit $y \leq x/2; y \geq -x; 0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m' x,y,1/4
(m_z 0,0,1/2)' | (17) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2)' | (18) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2)' |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (23) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (24) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [u,v, \bar{w}]	(5) $y,\bar{x}+y,z+1/2$ [$\bar{v},u-v,\bar{w}$]	(6) x-y,x,z+1/2 [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) x-y, \bar{y},\bar{z} [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [u,u-v,w]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) x,x-y, $\bar{z}+1/2$ [u,u-v, \bar{w}]
	(13) \bar{x},\bar{y},\bar{z} [u,v,w]	(14) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(15) x-y,x, \bar{z} [$\bar{u}+v,\bar{u},w$]
	(16) x,y, $\bar{z}+1/2$ [u,v, \bar{w}]	(17) $\bar{y},x-y,\bar{z}+1/2$ [$\bar{v},u-v,\bar{w}$]	(18) $\bar{x}+y,\bar{x},\bar{z}+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(19) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(20) $\bar{x}+y,y,z$ [$\bar{u}+v,v,w$]	(21) x,x-y,z [u,u-v,w]
	(22) y,x,z+1/2 [\bar{v},\bar{u},\bar{w}]	(23) x-y, $\bar{y},z+1/2$ [$\bar{u}+v,v,\bar{w}$]	(24) $\bar{x},\bar{x}+y,z+1/2$ [u,u-v, \bar{w}]
12 g .m'.	x,2x,z [u,2u,w]	2 \bar{x},\bar{x},z [2 \bar{u},\bar{u},w]	x, \bar{x},z [u, \bar{u},w]
	$\bar{x},2\bar{x},z+1/2$ [u,2u, \bar{w}]	2x,x,z+1/2 [2 \bar{u},\bar{u},\bar{w}]	$\bar{x},x,z+1/2$ [u, \bar{u},\bar{w}]
	2x,x, \bar{z} [2 \bar{u},\bar{u},w]	$\bar{x},2\bar{x},\bar{z}$ [u,2u,w]	\bar{x},x,\bar{z} [u, \bar{u},w]
	2 $\bar{x},\bar{x},\bar{z}+1/2$ [2 \bar{u},\bar{u},\bar{w}]	x,2x, $\bar{z}+1/2$ [u,2u, \bar{w}]	x, $\bar{x},\bar{z}+1/2$ [u, \bar{u},\bar{w}]
12 f m'..	x,y,1/4 [u,v,0]	$\bar{y},x-y,1/4$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},1/4$ [$\bar{u}+v,\bar{u},0$]
	$\bar{x},\bar{y},3/4$ [u,v,0]	y, $\bar{x}+y,3/4$ [$\bar{v},u-v,0$]	x-y,x,3/4 [$\bar{u}+v,\bar{u},0$]
	y,x,3/4 [$\bar{v},\bar{u},0$]	x-y, $\bar{y},3/4$ [$\bar{u}+v,v,0$]	$\bar{x},\bar{x}+y,3/4$ [u,u-v,0]
	$\bar{y},\bar{x},1/4$ [$\bar{v},\bar{u},0$]	$\bar{x}+y,y,1/4$ [$\bar{u}+v,v,0$]	x,x-y,1/4 [u,u-v,0]

Continued

No. 75.7.392

 $\rho 6_3$ 'm'm'c

12 e .2'	x,0,0 [u,2u,w]	0,x,0 [2 \bar{u} , \bar{u} ,w]	$\bar{x},\bar{x},0$ [u, \bar{u} ,w]
	$\bar{x},0,1/2$ [u,2u, \bar{w}]	0, $\bar{x},1/2$ [2 \bar{u} , \bar{u} , \bar{w}]	x,x,1/2 [u, \bar{u} , \bar{w}]
	$\bar{x},0,0$ [u,2u,w]	0, $\bar{x},0$ [2 \bar{u} , \bar{u} ,w]	x,x,0 [u, \bar{u} ,w]
	x,0,1/2 [u,2u, \bar{w}]	0,x,1/2 [2 \bar{u} , \bar{u} , \bar{w}]	$\bar{x},\bar{x},1/2$ [u, \bar{u} , \bar{w}]
6 d m'm'2	x,2x,1/4 [u,2u,0]	2 $\bar{x},\bar{x},1/4$ [2 \bar{u} , \bar{u} ,0]	x, $\bar{x},1/4$ [u, \bar{u} ,0]
	$\bar{x},2\bar{x},3/4$ [u,2u,0]	2x,x,3/4 [2 \bar{u} , \bar{u} ,0]	$\bar{x},x,3/4$ [u, \bar{u} ,0]
4 c 3m'	0,0,z [0,0,w]	0,0,z+1/2 [0,0, \bar{w}]	
	0,0, \bar{z} [0,0,w]	0,0, \bar{z} +1/2 [0,0, \bar{w}]	
2 b $\bar{6}$ 'm'2	0,0,1/4 [0,0,0]	0,0,3/4 [0,0,0]	
2 a $\bar{3}$ m'	0,0,0 [0,0,w]	0,0,1/2 [0,0, \bar{w}]	

Symmetry of special projections

Along [001] $6mm1'$	Along [100] $\rho 2'm'g$	Along [210] $\rho_{2a^*} 2'mm'$
Origin at 0,0,z	$a^* = c$ Origin at x,0,0	$a^* = c/2$ Origin at x,x/2,0

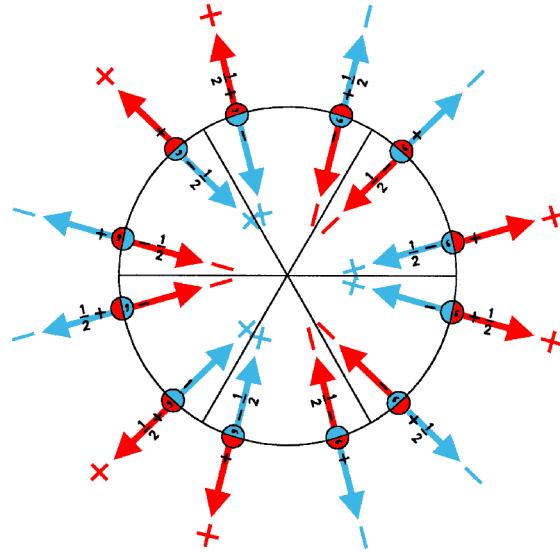
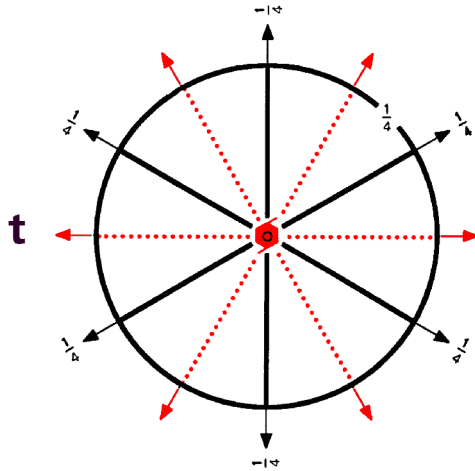
$p6_3'/mmc'$

$6'/mmm'$

Hexagonal

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$p6_3'/m2'/m2'/c'$



Origin at center ($\bar{3}'m1$) at $\bar{3}'2'/mc'$

Asymmetric unit $y \leq x/2$; $y \geq -x$; $0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) 2 x, \bar{x} ,1/4
(2_3 0,0,1/2) | (11) 2 x,2x,1/4
(2_2 0,0,1/2) | (12) 2 2x,x,1/4
(2_1 0,0,1/2) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m x,y,1/4
(m_z 0,0,1/2) | (17) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2) | (18) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2) |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) c' (0,0,1/2) x,x,z
(m_3 0,0,1/2)' | (23) c' (0,0,1/2) x,0,z
(m_2 0,0,1/2)' | (24) c' (0,0,1/2) 0,y,z
(m_1 0,0,1/2)' |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) $\bar{x},\bar{y},z+1/2$ [u,v,\bar{w}]	(5) $y,\bar{x}+y,z+1/2$ [$\bar{v},u-v,\bar{w}$]	(6) $x-y,x,z+1/2$ [$\bar{u}+v,\bar{u},\bar{w}$]
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [$u,u-v,w$]
	(10) $\bar{y},\bar{x},\bar{z}+1/2$ [\bar{v},\bar{u},\bar{w}]	(11) $\bar{x}+y,y,\bar{z}+1/2$ [$\bar{u}+v,v,\bar{w}$]	(12) $x,x-y,\bar{z}+1/2$ [$u,u-v,\bar{w}$]
	(13) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(14) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(15) $x-y,x,\bar{z}$ [$u-v,u,\bar{w}$]
	(16) $x,y,\bar{z}+1/2$ [\bar{u},\bar{v},w]	(17) $\bar{y},x-y,\bar{z}+1/2$ [$v,\bar{u}+v,w$]	(18) $\bar{x}+y,\bar{x},\bar{z}+1/2$ [$u-v,u,w$]
	(19) \bar{y},\bar{x},z [v,u,\bar{w}]	(20) $\bar{x}+y,y,z$ [$u-v,\bar{v},\bar{w}$]	(21) $x,x-y,z$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(22) $y,x,z+1/2$ [v,u,w]	(23) $x-y,\bar{y},z+1/2$ [$u-v,\bar{v},w$]	(24) $\bar{x},\bar{x}+y,z+1/2$ [$\bar{u},\bar{u}+v,w$]
12 g .m.	$x,2x,z$ [$u,0,0$]	$2\bar{x},\bar{x},z$ [$0,u,0$]	x,\bar{x},z [$\bar{u},\bar{u},0$]
	$\bar{x},2\bar{x},z+1/2$ [$u,0,0$]	$2x,x,z+1/2$ [$0,u,0$]	$\bar{x},x,z+1/2$ [$\bar{u},\bar{u},0$]
	$2x,x,\bar{z}$ [$0,\bar{u},0$]	$\bar{x},2\bar{x},\bar{z}$ [$\bar{u},0,0$]	\bar{x},x,\bar{z} [$u,u,0$]
	$2\bar{x},\bar{x},\bar{z}+1/2$ [$0,\bar{u},0$]	$x,2x,\bar{z}+1/2$ [$\bar{u},0,0$]	$x,\bar{x},\bar{z}+1/2$ [$u,u,0$]
12 f m..	$x,y,1/4$ [$0,0,w$]	$\bar{y},x-y,1/4$ [$0,0,w$]	$\bar{x}+y,\bar{x},1/4$ [$0,0,w$]
	$\bar{x},\bar{y},3/4$ [$0,0,\bar{w}$]	$y,\bar{x}+y,3/4$ [$0,0,\bar{w}$]	$x-y,x,3/4$ [$0,0,\bar{w}$]
	$y,x,3/4$ [$0,0,w$]	$x-y,\bar{y},3/4$ [$0,0,w$]	$\bar{x},\bar{x}+y,3/4$ [$0,0,w$]
	$\bar{y},\bar{x},1/4$ [$0,0,\bar{w}$]	$\bar{x}+y,y,1/4$ [$0,0,\bar{w}$]	$x,x-y,1/4$ [$0,0,\bar{w}$]

Continued

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 $p6_3$ '1mmc'

12 e .2'	$x,0,0$ [$u,2u,w$]	$0,x,0$ [$2\bar{u},\bar{u},w$]	$\bar{x},\bar{x},0$ [u,\bar{u},w]
	$\bar{x},0,1/2$ [$u,2u,\bar{w}$]	$0,\bar{x},1/2$ [$2\bar{u},\bar{u},\bar{w}$]	$x,x,1/2$ [u,\bar{u},\bar{w}]
	$\bar{x},0,0$ [$\bar{u},2\bar{u},\bar{w}$]	$0,\bar{x},0$ [$2u,u,\bar{w}$]	$x,x,0$ [\bar{u},u,\bar{w}]
	$x,0,1/2$ [$\bar{u},2\bar{u},w$]	$0,x,1/2$ [$2u,u,w$]	$\bar{x},\bar{x},1/2$ [\bar{u},u,w]
6 d mm ²	$x,2x,1/4$ [$0,0,0$]	$2\bar{x},\bar{x},1/4$ [$0,0,0$]	$x,\bar{x},1/4$ [$0,0,0$]
	$\bar{x},2\bar{x},3/4$ [$0,0,0$]	$2x,x,3/4$ [$0,0,0$]	$\bar{x},x,3/4$ [$0,0,0$]
4 c 3m.	$0,0,z$ [$0,0,0$]	$0,0,z+1/2$ [$0,0,0$]	
	$0,0,\bar{z}$ [$0,0,0$]	$0,0,\bar{z}+1/2$ [$0,0,0$]	
2 b $\bar{6}m2$	$0,0,1/4$ [$0,0,0$]	$0,0,3/4$ [$0,0,0$]	
2 a $\bar{3}m.$	$0,0,0$ [$0,0,0$]	$0,0,1/2$ [$0,0,0$]	

Symmetry of special projections

Along [001] $6'mm'$ Origin at $0,0,z$ Along [100] $p2mg1'$ $a^* = c$ Origin at $x,0,0$ Along [210] $p2mm$ $a^* = c/2$ Origin at $x,x/2,0$

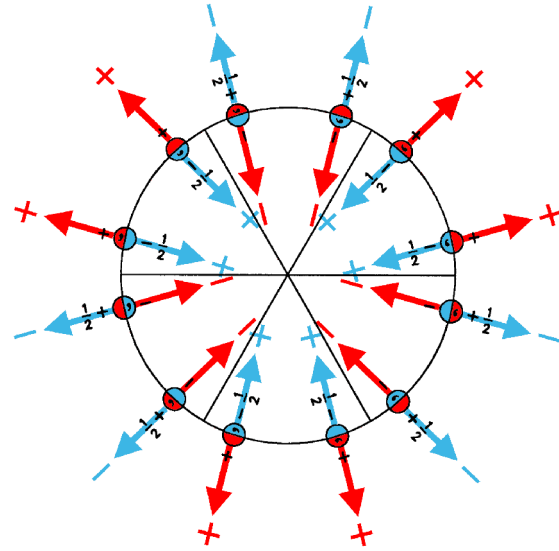
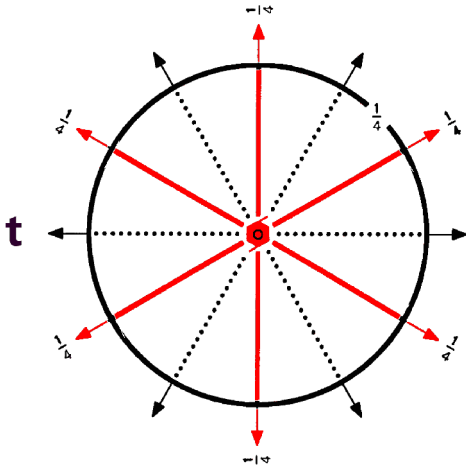
$\rho 6_3'/mm'c$

$6'/mm'm$

Hexagonal

No. 75.9.394

$\rho 6_3'/m2/m'2'/c$



Origin at center ($\bar{3}'m'1$) at $\bar{3}'2/m'c$

Asymmetric unit $y \leq x/2; y \geq -x; 0 \leq z \leq 1/4$

Symmetry operations

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ (0,0,1/2) 0,0,z
(2_z 0,0,1/2)' | (5) 6^- (0,0,1/2) 0,0,z
(6_z^{-1} 0,0,1/2)' | (6) 6^+ (0,0,1/2) 0,0,z
(6_z 0,0,1/2)' |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) $2'$ x, \bar{x} ,1/4
(2_3 0,0,1/2)' | (11) $2'$ x,2x,1/4
(2_2 0,0,1/2)' | (12) $2'$ 2x,x,1/4
(2_1 0,0,1/2)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m x,y,1/4
(m_z 0,0,1/2) | (17) $\bar{6}^-$ 0,0,z; 0,0,1/4
($\bar{6}_z^{-1}$ 0,0,1/2) | (18) $\bar{6}^+$ 0,0,z; 0,0,1/4
($\bar{6}_z$ 0,0,1/2) |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) c (0,0,1/2) x,x,z
(m_3 0,0,1/2) | (23) c (0,0,1/2) x,0,z
(m_2 0,0,1/2) | (24) c (0,0,1/2) 0,y,z
(m_1 0,0,1/2) |

Generators selected (1); t(0,0,1); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 h 1	(1) x,y,z [u,v,w]	(2) \bar{y} ,x-y,z [\bar{v} ,u-v,w]	(3) \bar{x} +y, \bar{x} ,z [\bar{u} +v, \bar{u} ,w]
	(4) \bar{x} , \bar{y} ,z+1/2 [u,v, \bar{w}]	(5) y, \bar{x} +y,z+1/2 [\bar{v} ,u-v, \bar{w}]	(6) x-y,x,z+1/2 [\bar{u} +v, \bar{u} , \bar{w}]
	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) x-y, \bar{y} , \bar{z} [u-v, \bar{v} , \bar{w}]	(9) \bar{x} , \bar{x} +y, \bar{z} [\bar{u} , \bar{u} +v, \bar{w}]
	(10) \bar{y} , \bar{x} , \bar{z} +1/2 [v,u,w]	(11) \bar{x} +y,y, \bar{z} +1/2 [u-v, \bar{v} ,w]	(12) x,x-y, \bar{z} +1/2 [\bar{u} , \bar{u} +v,w]
	(13) \bar{x} , \bar{y} , \bar{z} [\bar{u} , \bar{v} , \bar{w}]	(14) y, \bar{x} +y, \bar{z} [v, \bar{u} +v, \bar{w}]	(15) x-y,x, \bar{z} [u-v,u, \bar{w}]
	(16) x,y, \bar{z} +1/2 [\bar{u} , \bar{v} ,w]	(17) \bar{y} ,x-y, \bar{z} +1/2 [v, \bar{u} +v,w]	(18) \bar{x} +y, \bar{x} , \bar{z} +1/2 [u-v,u,w]
	(19) \bar{y} , \bar{x} ,z [\bar{v} , \bar{u} ,w]	(20) \bar{x} +y,y,z [\bar{u} +v,v,w]	(21) x,x-y,z [u,u-v,w]
	(22) y,x,z+1/2 [\bar{v} , \bar{u} , \bar{w}]	(23) x-y, \bar{y} ,z+1/2 [\bar{u} +v,v, \bar{w}]	(24) \bar{x} , \bar{x} +y,z+1/2 [u,u-v, \bar{w}]
12 g .m'	x,2x,z [u,2u,w]	2 \bar{x} , \bar{x} ,z [2 \bar{u} , \bar{u} ,w]	x, \bar{x} ,z [u, \bar{u} ,w]
	\bar{x} ,2 \bar{x} ,z+1/2 [u,2u, \bar{w}]	2x,x,z+1/2 [2 \bar{u} , \bar{u} , \bar{w}]	\bar{x} ,x,z+1/2 [u, \bar{u} , \bar{w}]
	2x,x, \bar{z} [2u,u, \bar{w}]	\bar{x} ,2 \bar{x} , \bar{z} [\bar{u} ,2 \bar{u} , \bar{w}]	\bar{x} ,x, \bar{z} [\bar{u} ,u, \bar{w}]
	2 \bar{x} , \bar{x} , \bar{z} +1/2 [2u,u,w]	x,2x, \bar{z} +1/2 [\bar{u} ,2 \bar{u} ,w]	x, \bar{x} , \bar{z} +1/2 [\bar{u} ,u,w]
12 f m..	x,y,1/4 [0,0,w]	\bar{y} ,x-y,1/4 [0,0,w]	\bar{x} +y, \bar{x} ,1/4 [0,0,w]
	\bar{x} , \bar{y} ,3/4 [0,0, \bar{w}]	y, \bar{x} +y,3/4 [0,0, \bar{w}]	x-y,x,3/4 [0,0, \bar{w}]
	y,x,3/4 [0,0, \bar{w}]	x-y, \bar{y} ,3/4 [0,0, \bar{w}]	\bar{x} , \bar{x} +y,3/4 [0,0, \bar{w}]
	\bar{y} , \bar{x} ,1/4 [0,0,w]	\bar{x} +y,y,1/4 [0,0,w]	x,x-y,1/4 [0,0,w]

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 $\rho 6_3'/\text{mm}'c$

12 e .2.	$x,0,0 [u,0,0]$	$0,x,0 [0,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$
	$\bar{x},0,1/2 [u,0,0]$	$0,\bar{x},1/2 [0,u,0]$	$x,x,1/2 [\bar{u},\bar{u},0]$
	$\bar{x},0,0 [\bar{u},0,0]$	$0,\bar{x},0 [0,\bar{u},0]$	$x,x,0 [u,u,0]$
	$x,0,1/2 [\bar{u},0,0]$	$0,x,1/2 [0,\bar{u},0]$	$\bar{x},\bar{x},1/2 [u,u,0]$
6 d $\text{mm}'2'$	$x,2x,1/4 [0,0,w]$	$2\bar{x},\bar{x},1/4 [0,0,w]$	$x,\bar{x},1/4 [0,0,w]$
	$\bar{x},2\bar{x},3/4 [0,0,\bar{w}]$	$2x,x,3/4 [0,0,\bar{w}]$	$\bar{x},x,3/4 [0,0,\bar{w}]$
4 c $3\text{m}'$.	$0,0,z [0,0,w]$	$0,0,z+1/2 [0,0,\bar{w}]$	
	$0,0,\bar{z} [0,0,\bar{w}]$	$0,0,\bar{z}+1/2 [0,0,w]$	
2 b $\bar{6}\text{m}'2'$	$0,0,1/4 [0,0,w]$	$0,0,3/4 [0,0,\bar{w}]$	
2 a $\bar{3}\text{m}'$.	$0,0,0 [0,0,0]$	$0,0,1/2 [0,0,0]$	

Symmetry of special projections

Along [001] $6\text{m}'\text{m}$	Along [100] $\rho 2\text{mg}$	Along [210] $\rho_{2a^*}2\text{m}'\text{m}'$
Origin at 0,0,z	$\mathbf{a}^* = \mathbf{c}$ Origin at x,0,0	$\mathbf{a}^* = \mathbf{c}/2$ Origin at x,x/2,0