

$c2/m11$

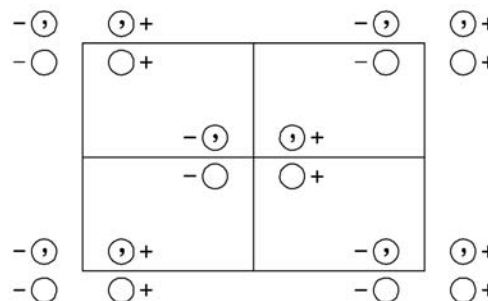
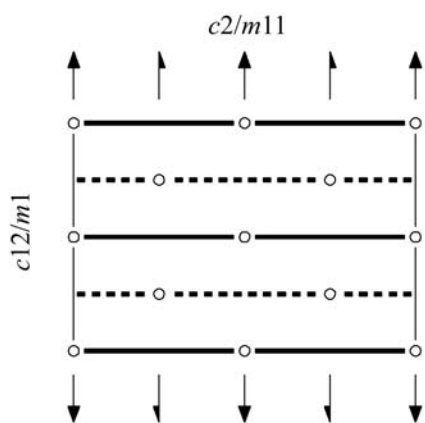
$2/m$

Monoclinic/Rectangular

No. 18

$c2/m11$

Patterson symmetry  $c2/m11$



**Origin** at centre ( $2/m$ )

**Asymmetric unit**  $0 \leq x \leq \frac{1}{4}$ ;  $0 \leq y \leq \frac{1}{2}$

**Symmetry operations**

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

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

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

- |   |   |  |  |
|---|---|--|--|
| (1) $t(\frac{1}{2}, \frac{1}{2}, 0)$<br>$(1 \frac{1}{2}, \frac{1}{2}, 0)$ | (2) $2(\frac{1}{2}, 0, 0)$ $x, \frac{1}{4}, 0$<br>$(2_x \frac{1}{2}, \frac{1}{2}, 0)$ | (3) $\bar{1}$ $\frac{1}{4}, \frac{1}{4}, 0$<br>$(\bar{1} \frac{1}{2}, \frac{1}{2}, 0)$ | (4) $b$ $\frac{1}{4}, y, z$<br>$(m_x \frac{1}{2}, \frac{1}{2}, 0)$ |
|---|---|--|--|

**Generators selected** (1);  $t(1,0,0)$ ;  $t(0,1,0)$ ;  $t(\frac{1}{2}, \frac{1}{2}, 0)$ ; (2); (3)

**Positions**

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				Reflection conditions
	(0,0,0)+	$(\frac{1}{2}, \frac{1}{2}, 0)+$			General:
8 <i>f</i> 1	(1) $x, y, z$	(2) $x, \bar{y}, \bar{z}$	(3) $\bar{x}, \bar{y}, \bar{z}$	(4) $\bar{x}, y, z$	$hk: h+k=2n$ $h0: h=2n$ $0k: k=2n$
					Special: as above, plus
4 <i>e</i> <i>m</i>	$0, y, z$	$0, \bar{y}, \bar{z}$			no extra conditions
4 <i>d</i> 2	$x, 0, 0$	$\bar{x}, 0, 0$			no extra conditions
4 <i>c</i> $\bar{1}$	$\frac{1}{4}, \frac{1}{4}, 0$	$\frac{1}{4}, \frac{3}{4}, 0$			$hk: k=2n$
2 <i>b</i> $2/m$	$\frac{1}{2}, 0, 0$				no extra conditions
2 <i>a</i> $2/m$	$0, 0, 0$				no extra conditions

**Symmetry of special projections**

Along [001]  $c2mm$   
 $\mathbf{a}' = \mathbf{a}$      $\mathbf{b}' = \mathbf{b}_p$   
 Origin at  $0, 0, z$

Along [100]  $\cancel{2}11$   
 $\mathbf{a}' = \frac{1}{2}\mathbf{b}$   
 Origin at  $x, 0, 0$

Along [010]  $\cancel{2}mm$   
 $\mathbf{a}' = \frac{1}{2}\mathbf{a}$   
 Origin at  $0, y, 0$

**Maximal non-isotypic subgroups**

<b>I</b>	[2] $cm11$ (13)	(1; 4)+
	[2] $c211$ (10)	(1; 2)+
	[2] $c\bar{1}$ ( $p\bar{1}, 2$ )	(1; 3)+
<b>IIa</b>	[2] $p2_1/b11$ (17)	1; 3; (2; 4) + $(\frac{1}{2}, \frac{1}{2}, 0)$
	[2] $p2/b11$ (16)	1; 2; (3; 4) + $(\frac{1}{2}, \frac{1}{2}, 0)$
	[2] $p2_1/m11$ (15)	1; 4; (2; 3) + $(\frac{1}{2}, \frac{1}{2}, 0)$
	[2] $p2/m11$ (14)	1; 2; 3; 4
<b>IIb</b>	none	

**Maximal isotypic subgroups of lowest index**

**IIc** [3]  $c2/m11$  ( $\mathbf{a}' = 3\mathbf{a}$ ) (18)

**Minimal non-isotypic supergroups**

<b>I</b>	[2] $cmmm$ (47); [2] $cmme$ (48); [3] $p\bar{3}1m$ (71); [3] $p\bar{3}m1$ (72)
<b>II</b>	[2] $p2/m11$ ( $\mathbf{a}' = \frac{1}{2}\mathbf{a}, \mathbf{b}' = \frac{1}{2}\mathbf{b}$ ) (14)