

$c2mm$

No. 9

 $c2mm$
Generators selected (1); $t(1,0)$; $t(0,1)$; $t(\frac{1}{2}, \frac{1}{2})$; (2); (3)

General position

 Multiplicity,
Wyckoff letter,
Site symmetry

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

 8 f 1

 (1) x,y (2) \bar{x},\bar{y} (3) \bar{x},y (4) x,\bar{y}
I Maximal translationengleiche subgroups

[2] $c1m1$ (5, cm)	(1; 3)+	
[2] $c11m$ (5, cm)	(1; 4)+	b, -a
[2] $c211$ (2, $p2$)	(1; 2)+	$1/2(\mathbf{a}-\mathbf{b}), 1/2(\mathbf{a}+\mathbf{b})$

II Maximal klassengleiche subgroups

• Loss of centring translations

[2] $p2gg$ (8)	1; 2; (3; 4) + $(\frac{1}{2}, \frac{1}{2})$		
[2] $p2gm$ (7, $p2mg$)	1; 4; (2; 3) + $(\frac{1}{2}, \frac{1}{2})$	b, -a	1/4, 1/4
[2] $p2mg$ (7)	1; 3; (2; 4) + $(\frac{1}{2}, \frac{1}{2})$		1/4, 1/4
[2] $p2mm$ (6)	1; 2; 3; 4		

• Enlarged unit cell

[3] $\mathbf{a}' = 3\mathbf{a}$			
$c2mm$ (9)	$\langle 2; 3 \rangle$	3a, b	
$c2mm$ (9)	$\langle (2; 3) + (2, 0) \rangle$	3a, b	1, 0
$c2mm$ (9)	$\langle (2; 3) + (4, 0) \rangle$	3a, b	2, 0
[3] $\mathbf{b}' = 3\mathbf{b}$			
$c2mm$ (9)	$\langle 2; 3 \rangle$	a, 3b	
$c2mm$ (9)	$\langle 3; 2 + (0, 2) \rangle$	a, 3b	0, 1
$c2mm$ (9)	$\langle 3; 2 + (0, 4) \rangle$	a, 3b	0, 2

• Series of maximal isomorphic subgroups

[p] $\mathbf{a}' = p\mathbf{a}$			
$c2mm$ (9)	$\langle (2; 3) + (2u, 0) \rangle$	pa, b	$u, 0$
	$p > 2; 0 \leq u < p$		
	p conjugate subgroups for the prime p		
[p] $\mathbf{b}' = p\mathbf{b}$			
$c2mm$ (9)	$\langle 3; 2 + (0, 2u) \rangle$	a, pb	$0, u$
	$p > 2; 0 \leq u < p$		
	p conjugate subgroups for the prime p		

I Minimal translationengleiche supergroups

 [2] $p4mm$ (11); [2] $p4gm$ (12); [3] $p6mm$ (17)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

none

• Decreased unit cell

 [2] $\mathbf{a}' = \frac{1}{2}\mathbf{a}, \mathbf{b}' = \frac{1}{2}\mathbf{b}$ $p2mm$ (6)