

$D_2^3$ 
 $P2_12_12$ 

No. 18

 $P2_12_12$ 
**Generators selected** (1);  $t(1,0,0)$ ;  $t(0,1,0)$ ;  $t(0,0,1)$ ; (2); (3)

**General position**

 Multiplicity,  
 Wyckoff letter,  
 Site symmetry

Coordinates

 4  $c$  1 (1)  $x, y, z$  (2)  $\bar{x}, \bar{y}, z$  (3)  $\bar{x} + \frac{1}{2}, y + \frac{1}{2}, \bar{z}$  (4)  $x + \frac{1}{2}, \bar{y} + \frac{1}{2}, \bar{z}$ 
**I Maximal translationengleiche subgroups**

[2] $P12_11$ (4)	1; 3		$1/4, 0, 0$
[2] $P2_111$ (4, $P12_11$ )	1; 4	<b>c, a, b</b>	$0, 1/4, 0$
[2] $P112$ (3)	1; 2		

**II Maximal klassengleiche subgroups**

## • Enlarged unit cell

[2] $c' = 2c$			
$P2_12_12_1$ (19)	$\langle 3; 2 + (0, 0, 1) \rangle$	<b>a, b, 2c</b>	$1/4, 0, 1/2$
$P2_12_12_1$ (19)	$\langle (2; 3) + (0, 0, 1) \rangle$	<b>a, b, 2c</b>	$1/4, 0, 0$
$P2_12_12$ (18)	$\langle 2; 3 \rangle$	<b>a, b, 2c</b>	
$P2_12_12$ (18)	$\langle 2; 3 + (0, 0, 1) \rangle$	<b>a, b, 2c</b>	$0, 0, 1/2$
[3] $a' = 3a$			
$P2_12_12$ (18)	$\langle 2; 3 + (1, 0, 0) \rangle$	<b>3a, b, c</b>	
$P2_12_12$ (18)	$\langle 2 + (2, 0, 0); 3 + (3, 0, 0) \rangle$	<b>3a, b, c</b>	$1, 0, 0$
$P2_12_12$ (18)	$\langle 2 + (4, 0, 0); 3 + (5, 0, 0) \rangle$	<b>3a, b, c</b>	$2, 0, 0$
[3] $b' = 3b$			
$P2_12_12$ (18)	$\langle 2; 3 + (0, 1, 0) \rangle$	<b>a, 3b, c</b>	
$P2_12_12$ (18)	$\langle 2 + (0, 2, 0); 3 + (0, 1, 0) \rangle$	<b>a, 3b, c</b>	$0, 1, 0$
$P2_12_12$ (18)	$\langle 2 + (0, 4, 0); 3 + (0, 1, 0) \rangle$	<b>a, 3b, c</b>	$0, 2, 0$
[3] $c' = 3c$			
$P2_12_12$ (18)	$\langle 2; 3 \rangle$	<b>a, b, 3c</b>	
$P2_12_12$ (18)	$\langle 2; 3 + (0, 0, 2) \rangle$	<b>a, b, 3c</b>	$0, 0, 1$
$P2_12_12$ (18)	$\langle 2; 3 + (0, 0, 4) \rangle$	<b>a, b, 3c</b>	$0, 0, 2$

## • Series of maximal isomorphic subgroups

[ $p$ ] $a' = pa$			
$P2_12_12$ (18)	$\langle 2 + (2u, 0, 0); 3 + (\frac{p}{2} - \frac{1}{2} + 2u, 0, 0) \rangle$	<b>pa, b, c</b>	$u, 0, 0$
	$p > 2; 0 \leq u < p$		
	$p$ conjugate subgroups for the prime $p$		
[ $p$ ] $b' = pb$			
$P2_12_12$ (18)	$\langle 2 + (0, 2u, 0); 3 + (0, \frac{p}{2} - \frac{1}{2}, 0) \rangle$	<b>a, pb, c</b>	$0, u, 0$
	$p > 2; 0 \leq u < p$		
	$p$ conjugate subgroups for the prime $p$		
[ $p$ ] $c' = pc$			
$P2_12_12$ (18)	$\langle 2; 3 + (0, 0, 2u) \rangle$	<b>a, b, pc</b>	$0, 0, u$
	$p > 2; 0 \leq u < p$		
	$p$ conjugate subgroups for the prime $p$		

**I Minimal translationengleiche supergroups**

 [2]  $Pbam$  (55); [2]  $Pccn$  (56); [2]  $Pbcm$  (57); [2]  $Pnmm$  (58); [2]  $Pmmn$  (59); [2]  $Pbcn$  (60); [2]  $P42_12$  (90); [2]  $P4_22_12$  (94);  
 [2]  $P\bar{4}2_1m$  (113); [2]  $P\bar{4}2_1c$  (114)

**II Minimal non-isomorphic klassengleiche supergroups**

## • Additional centring translations

 [2]  $A2_122$  (20,  $C222_1$ ); [2]  $B22_12$  (20,  $C222_1$ ); [2]  $C222$  (21); [2]  $I222$  (23)

## • Decreased unit cell

 [2]  $a' = \frac{1}{2}a$   $P22_12$  (17,  $P222_1$ ); [2]  $b' = \frac{1}{2}b$   $P2_122$  (17,  $P222_1$ )