

$P3_121$ 

## No. 152

 $D_3^4$ 

Axes	Coordinates	Wyckoff positions		
		$3a$	$3b$	$6c$
<b>I Maximal translationengleiche subgroups</b>				
[2] $P3_1$ (144)		$3a$	$3a$	$2 \times 3a$
[3] $C121$ (5)	$\mathbf{a-b, a+b, c}$ $\frac{1}{2}(x-y), \frac{1}{2}(x+y), z$	$2a; 4c$	$2b; 4c$	$3 \times 4c$
	conjugate: $2\mathbf{a+b, b, c}$ $\frac{1}{2}x, -\frac{1}{2}x+y, z+\frac{1}{3}$			
	conjugate: $\mathbf{a+2b, -a, c}$ $\frac{1}{2}y, -x+\frac{1}{2}y, z-\frac{1}{3}$			
<b>II Maximal klassengleiche subgroups</b>				
<b>Enlarged unit cell, non-isomorphic</b>				
[3] $P3_12$ (151)	$2\mathbf{a+b, -a+b, c}$ $\frac{1}{3}(x+y), \frac{1}{3}(-x+2y), z; \pm(\frac{2}{3}, \frac{1}{3}, 0)$	$3 \times 3a$	$3 \times 3b$	$3 \times 6c$
<b>Enlarged unit cell, isomorphic</b>				
[2] $P3_221$ (154)	$\mathbf{a, b, 2c}$ $x, y, \frac{1}{2}z; +(0, 0, \frac{1}{2})$	$3a; 3b$	$6c$	$2 \times 6c$
[2] $P3_221$ (154)	$\mathbf{a, b, 2c}$ $x, y, \frac{1}{2}z+\frac{1}{4}; +(0, 0, \frac{1}{2})$	$6c$	$3a; 3b$	$2 \times 6c$
[5] $P3_221$ (154)	$\mathbf{a, b, 5c}$ $x, y, \frac{1}{5}z; \pm(0, 0, \frac{1}{5}); \pm(0, 0, \frac{2}{5})$	$3a; 2 \times 6c$	$3b; 2 \times 6c$	$5 \times 6c$
[ $p$ ] $P3_221$ (154)	$\mathbf{a, b, pc}$ $x, y, \frac{1}{p}z; +(0, 0, \frac{u}{p})$ $p = \text{prime} = 6n-1; u = 1, \dots, p-1$	$3a; \frac{p-1}{2} \times 6c$	$3b; \frac{p-1}{2} \times 6c$	$p \times 6c$
[7] $P3_121$	$\mathbf{a, b, 7c}$ $x, y, \frac{1}{7}z; \pm(0, 0, \frac{1}{7}); \pm(0, 0, \frac{2}{7}); \pm(0, 0, \frac{3}{7})$	$3a; 3 \times 6c$	$3b; 3 \times 6c$	$7 \times 6c$
[ $p$ ] $P3_121$	$\mathbf{a, b, pc}$ $x, y, \frac{1}{p}z; +(0, 0, \frac{u}{p})$ $p = \text{prime} = 6n+1; u = 1, \dots, p-1$	$3a; \frac{p-1}{2} \times 6c$	$3b; \frac{p-1}{2} \times 6c$	$p \times 6c$
[4] $P3_121$	$2\mathbf{a, 2b, c}$ $\frac{1}{2}x, \frac{1}{2}y, z; +(\frac{1}{2}, 0, 0); +(0, \frac{1}{2}, 0); +(\frac{1}{2}, \frac{1}{2}, 0)$	$2 \times 3a; 6c$	$2 \times 3b; 6c$	$4 \times 6c$
[ $p^2$ ] $P3_121$	$p\mathbf{a, pb, c}$ $\frac{1}{p}x, \frac{1}{p}y, z; +(\frac{u}{p}, \frac{v}{p}, 0)$ $p = \text{prime} \neq 3; u, v = 1, \dots, p-1$	$p \times 3a; \frac{p(p-1)}{2} \times 6c$	$p \times 3b; \frac{p(p-1)}{2} \times 6c$	$p^2 \times 6c$