

*P*23

T^1

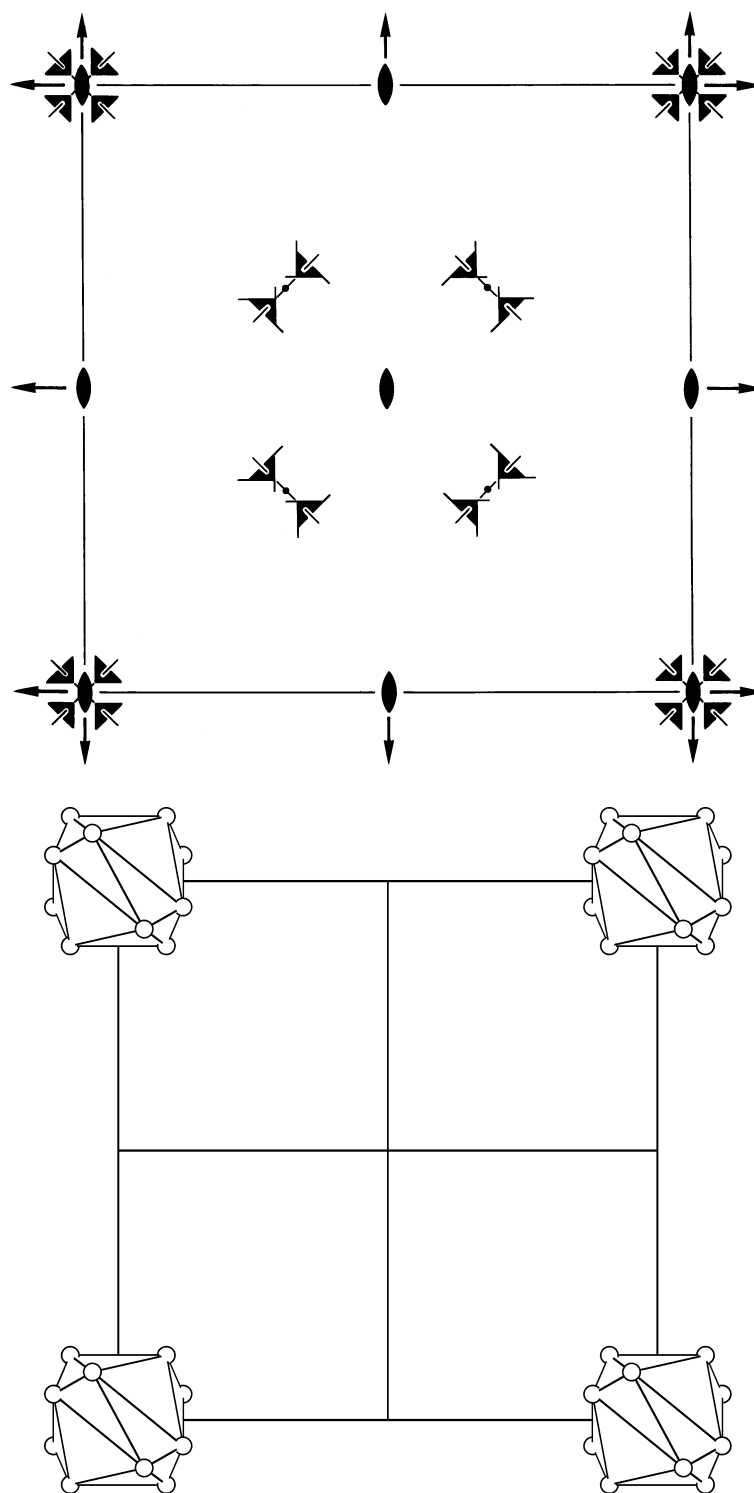
23

Cubic

No. 195

*P*23

Patterson symmetry $Pm\bar{3}$



Origin at 23

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z \leq \frac{1}{2}; y \leq 1-x; z \leq \min(x,y)$

Vertices $0,0,0 \quad 1,0,0 \quad 0,1,0 \quad \frac{1}{2}, \frac{1}{2}, \frac{1}{2}$

Symmetry operations

- | | | | |
|----------------------------|---|---|---|
| (1) 1 | (2) 2 $0,0,z$ | (3) 2 $0,y,0$ | (4) 2 $x,0,0$ |
| (5) 3 ⁺ x,x,x | (6) 3 ⁺ \bar{x},x,\bar{x} | (7) 3 ⁺ x,\bar{x},\bar{x} | (8) 3 ⁺ \bar{x},\bar{x},x |
| (9) 3 ⁻ x,x,x | (10) 3 ⁻ x,\bar{x},\bar{x} | (11) 3 ⁻ \bar{x},\bar{x},x | (12) 3 ⁻ \bar{x},x,\bar{x} |

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

Positions

Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

Reflection conditions

h, k, l cyclically permutable

General:

12	<i>j</i>	1	(1) x, y, z (5) z, x, y (9) y, z, x	(2) \bar{x}, \bar{y}, z (6) z, \bar{x}, \bar{y} (10) \bar{y}, z, \bar{x}	(3) \bar{x}, y, \bar{z} (7) \bar{z}, \bar{x}, y (11) y, \bar{z}, \bar{x}	(4) x, \bar{y}, \bar{z} (8) \bar{z}, x, \bar{y} (12) \bar{y}, \bar{z}, x
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no conditions

Special: no extra conditions

6	<i>i</i>	2..	$x, \frac{1}{2}, \frac{1}{2}$	$\bar{x}, \frac{1}{2}, \frac{1}{2}$	$\frac{1}{2}, x, \frac{1}{2}$	$\frac{1}{2}, \bar{x}, \frac{1}{2}$	$\frac{1}{2}, \frac{1}{2}, x$	$\frac{1}{2}, \frac{1}{2}, \bar{x}$
6	<i>h</i>	2..	$x, \frac{1}{2}, 0$	$\bar{x}, \frac{1}{2}, 0$	$0, x, \frac{1}{2}$	$0, \bar{x}, \frac{1}{2}$	$\frac{1}{2}, 0, x$	$\frac{1}{2}, 0, \bar{x}$
6	<i>g</i>	2..	$x, 0, \frac{1}{2}$	$\bar{x}, 0, \frac{1}{2}$	$\frac{1}{2}, x, 0$	$\frac{1}{2}, \bar{x}, 0$	$0, \frac{1}{2}, x$	$0, \frac{1}{2}, \bar{x}$
6	<i>f</i>	2..	$x, 0, 0$	$\bar{x}, 0, 0$	$0, x, 0$	$0, \bar{x}, 0$	$0, 0, x$	$0, 0, \bar{x}$
4	<i>e</i>	.3.	x, x, x	\bar{x}, \bar{x}, x	\bar{x}, x, \bar{x}	x, \bar{x}, \bar{x}		
3	<i>d</i>	222..	$\frac{1}{2}, 0, 0$	$0, \frac{1}{2}, 0$	$0, 0, \frac{1}{2}$			
3	<i>c</i>	222..	$0, \frac{1}{2}, \frac{1}{2}$	$\frac{1}{2}, 0, \frac{1}{2}$	$\frac{1}{2}, \frac{1}{2}, 0$			
1	<i>b</i>	23.	$\frac{1}{2}, \frac{1}{2}, \frac{1}{2}$					
1	<i>a</i>	23.	$0, 0, 0$					

Symmetry of special projections

Along [001] $p2mm$

$\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$

Origin at $0, 0, z$

Along [111] $p3$

$\mathbf{a}' = \frac{1}{3}(2\mathbf{a} - \mathbf{b} - \mathbf{c})$

Origin at x, x, x

$\mathbf{b}' = \frac{1}{3}(-\mathbf{a} + 2\mathbf{b} - \mathbf{c})$

Along [110] $p1m1$

$\mathbf{a}' = \frac{1}{2}(-\mathbf{a} + \mathbf{b})$ $\mathbf{b}' = \mathbf{c}$

Origin at $x, x, 0$