# $P3m1$ No. 156 $C_{3v}^{1}$

| | Axes | Coordinates | Wyckoff positions $1a$ | $1b$ | $1c$ | $3d$ | $6e$ |
|---|---|---|---|---|---|---|---|
| **I Maximal *translationengleiche* subgroups** | | | | | | | |
| [2] $P3$ (143) | | | $1a$ | $1b$ | $1c$ | $3d$ | $2\times3d$ |
| [3] $C1m1$ (8) | $2\mathbf{a}+\mathbf{b}, \mathbf{b}, \mathbf{c}$ | $\frac{1}{2}x, -\frac{1}{2}x+y, z$ | $2a$ | $2a$ | $2a$ | $2a;4b$ | $3\times4b$ |
| conjugate: | $\mathbf{a}-\mathbf{b}, \mathbf{a}+\mathbf{b}, \mathbf{c}$ | $\frac{1}{2}(x-y), \frac{1}{2}(x+y), z$ | | | | | |
| conjugate: | $\mathbf{a}+2\mathbf{b}, -\mathbf{a}, \mathbf{c}$ | $\frac{1}{2}y, -x+\frac{1}{2}y, z$ | | | | | |
| **II Maximal *klassengleiche* subgroups** | | | | | | | |
| **Enlarged unit cell, non-isomorphic** | | | | | | | |
| [2] $P3c1$ (158) | $\mathbf{a}, \mathbf{b}, 2\mathbf{c}$ | $x, y, \frac{1}{2}z; +(0,0,\frac{1}{2})$ | $2a$ | $2b$ | $2c$ | $6d$ | $2\times6d$ |
| [3] $P31m$ (157) | $2\mathbf{a}+\mathbf{b}, -\mathbf{a}+\mathbf{b}, \mathbf{c}$ | $\frac{1}{3}(x+y), \frac{1}{3}(-x+2y), z;$ $\pm(\frac{2}{3},\frac{1}{3},0)$ | $1a;2b$ | $3c$ | $3c$ | $3c;6d$ | $3\times6d$ |
| [3] $P31m$ (157) | $2\mathbf{a}+\mathbf{b}, -\mathbf{a}+\mathbf{b}, \mathbf{c}$ | $\frac{1}{3}(x+y)+\frac{1}{3}, \frac{1}{3}(-x+2y), z;$ $\pm(\frac{2}{3},\frac{1}{3},0)$ | $3c$ | $1a;2b$ | $3c$ | $3c;6d$ | $3\times6d$ |
| [3] $P31m$ (157) | $2\mathbf{a}+\mathbf{b}, -\mathbf{a}+\mathbf{b}, \mathbf{c}$ | $\frac{1}{3}(x+y)-\frac{1}{3}, \frac{1}{3}(-x+2y), z;$ $\pm(\frac{2}{3},\frac{1}{3},0)$ | $3c$ | $3c$ | $1a;2b$ | $3c;6d$ | $3\times6d$ |
| **Enlarged unit cell, isomorphic** | | | | | | | |
| [2] $P3m1$ | $\mathbf{a}, \mathbf{b}, 2\mathbf{c}$ | $x, y, \frac{1}{2}z; +(0,0,\frac{1}{2})$ | $2\times1a$ | $2\times1b$ | $2\times1c$ | $2\times3d$ | $2\times6e$ |
| [3] $P3m1$ | $\mathbf{a}, \mathbf{b}, 3\mathbf{c}$ | $x, y, \frac{1}{3}z; \pm(0,0,\frac{1}{3})$ | $3\times1a$ | $3\times1b$ | $3\times1c$ | $3\times3d$ | $3\times6e$ |
| [$p$] $P3m1$ | $\mathbf{a}, \mathbf{b}, p\mathbf{c}$ $p=$prime; $u=1,\ldots,p-1$ | $x, y, \frac{1}{p}z; +(0,0,\frac{u}{p})$ | $p\times1a$ | $p\times1b$ | $p\times1c$ | $p\times3d$ | $p\times6e$ |
| [4] $P3m1$ | $2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$ | $\frac{1}{2}x, \frac{1}{2}y, z; +(\frac{1}{2},0,0);$ $+(0,\frac{1}{2},0); +(\frac{1}{2},\frac{1}{2},0)$ | $1a;3d$ | $1c;3d$ | $1b;3d$ | $2\times3d;6e$ | $4\times6e$ |
| [$p^2$] $P3m1$ | $p\mathbf{a}, p\mathbf{b}, \mathbf{c}$ $p=$ prime $\neq 3$; $u,v=1,\ldots,p-1$ | $\frac{1}{p}x, \frac{1}{p}y, z; +(\frac{u}{p},\frac{v}{p},0)$ | $1a;(p-1)\times3d;$ $\frac{(p-1)(p-2)}{6}\times6e$ | $1b(c^*);$ $(p-1)\times3d;$ $\frac{(p-1)(p-2)}{6}\times6e$ | $1c(b^*);$ $(p-1)\times3d;$ $\frac{(p-1)(p-2)}{6}\times6e$ | $p\times3d;$ $\frac{p(p-1)}{2}\times6e$ | $p^2\times6e$ |

* $p=3n-1$

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