

11. SYMMETRY OPERATIONS

Table 11.2.2.2. Matrices for point-group symmetry operations and orientation of corresponding symmetry elements, referred to a hexagonal coordinate system (cf. Table 2.1.2.1)

Symbol of symmetry operation and orientation of symmetry element	Transformed coordinates $\bar{x}, \bar{y}, \bar{z}$	Matrix W	Symbol of symmetry operation and orientation of symmetry element	Transformed coordinates $\bar{x}, \bar{y}, \bar{z}$	Matrix W	Symbol of symmetry operation and orientation of symmetry element	Transformed coordinates $\bar{x}, \bar{y}, \bar{z}$	Matrix W
1	x, y, z	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	3^+ $0, 0, z$	$\bar{y}, x - y, z$	$\begin{pmatrix} 0 & \bar{1} & 0 \\ 1 & \bar{1} & 0 \\ 0 & 0 & 1 \end{pmatrix}$	3^- $0, 0, z$	$y - x, \bar{x}, z$	$\begin{pmatrix} \bar{1} & 1 & 0 \\ \bar{1} & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
2 $0, 0, z$	\bar{x}, \bar{y}, z	$\begin{pmatrix} \bar{1} & 0 & 0 \\ 0 & \bar{1} & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$[001]$	6^+ $0, 0, z$	$\begin{pmatrix} 1 & \bar{1} & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	6^- $0, 0, z$	$y, y - x, z$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
2 $x, x, 0$	y, x, \bar{z}	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$	$[001]$	2 $x, 0, 0$	$\begin{pmatrix} 1 & \bar{1} & 0 \\ 0 & \bar{1} & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$	2 $0, y, 0$	$\bar{x}, y - x, \bar{z}$	$\begin{pmatrix} \bar{1} & 0 & 0 \\ \bar{1} & 1 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$
2 $x, \bar{x}, 0$	$\bar{y}, \bar{x}, \bar{z}$	$\begin{pmatrix} 0 & \bar{1} & 0 \\ \bar{1} & 0 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$	$[100]$	2 $x, 2x, 0$	$\begin{pmatrix} \bar{1} & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$	2 $2x, x, 0$	$x, x - y, \bar{z}$	$\begin{pmatrix} 1 & 0 & 0 \\ 1 & \bar{1} & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$
$\bar{1}$ $0, 0, 0$	$\bar{x}, \bar{y}, \bar{z}$	$\begin{pmatrix} \bar{1} & 0 & 0 \\ 0 & \bar{1} & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$	$[120]$	$\bar{3}^+$ $0, 0, z$	$\begin{pmatrix} 0 & 1 & 0 \\ \bar{1} & 1 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$	$\bar{3}^-$ $0, 0, z$	$x - y, x, \bar{z}$	$\begin{pmatrix} 1 & \bar{1} & 0 \\ 1 & 0 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$
m $x, y, 0$	x, y, \bar{z}	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$	$[001]$	$\bar{6}^+$ $0, 0, z$	$\begin{pmatrix} \bar{1} & 1 & 0 \\ \bar{1} & 0 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$	$\bar{6}^-$ $0, 0, z$	$\bar{y}, x - y, \bar{z}$	$\begin{pmatrix} 0 & \bar{1} & 0 \\ 1 & \bar{1} & 0 \\ 0 & 0 & \bar{1} \end{pmatrix}$
m x, \bar{x}, z	\bar{y}, \bar{x}, z	$\begin{pmatrix} 0 & \bar{1} & 0 \\ \bar{1} & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$[001]$	m $x, 2x, z$	$\begin{pmatrix} \bar{1} & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	m $2x, x, z$	$x, x - y, z$	$\begin{pmatrix} 1 & 0 & 0 \\ 1 & \bar{1} & 0 \\ 0 & 0 & 1 \end{pmatrix}$
m x, x, z	y, x, z	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$[100]$	m $x, 0, z$	$\begin{pmatrix} 1 & \bar{1} & 0 \\ 0 & \bar{1} & 0 \\ 0 & 0 & 1 \end{pmatrix}$	m $0, y, z$	$\bar{x}, y - x, z$	$\begin{pmatrix} 1 & 0 & 0 \\ \bar{1} & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
			$[120]$					