

# 230 Space Groups (detail)

表 1: No. 1  $C_1^1$   $P1$  [ triclinic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

表 2: No. 2  $C_i^1$   $P-1$  [ triclinic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

表 3: No. 3  $C_2^1$   $P2$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$

表 4: No. 4  $C_2^2 P2_1$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$

表 5: No. 5  $C_2^3$  C2 (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$

表 6: No. 6  $C_s^1 Pm$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$

表 7: No. 7  $C_s^2$   $Pc$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$

表 8: No. 8  $C_s^3$   $Cm$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$



表 9: No. 9  $C_s^4$   $Cc$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$

表 10: No. 10  $C_{2h}^1$   $P2/m$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
③ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
④ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$

表 11: No. 11  $C_{2h}^2$   $P2_1/m$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$
③ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
④ $\{m_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$

表 12: No. 12  $C_{2h}^3$   $C2/m$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
③ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
④ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$

表 13: No. 13  $C_{2h}^4$   $P2/c$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
③ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
④ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$

表 14: No. 14  $C_{2h}^5$   $P2_1/c$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
③ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
④ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

表 15: No. 15  $C_{2h}^6$   $C2/c$  (b-axis setting) [ monoclinic ]  
 $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
③ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
④ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$

表 16: No. 16  $D_2^1$   $P222$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$



表 17: No. 17  $D_2^2$   $P222_1$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 18: No. 18  $D_2^3$   $P2_12_12$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & Y+\frac{1}{2} & -Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & \frac{1}{2}-y & -z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & -Z \end{pmatrix}$

表 19: No. 19  $D_2^4$   $P2_12_12_1$  [ orthorhombic ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$

表 20: No. 20  $D_2^5$   $C222_1$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 21: No. 21  $D_2^6$   $C222$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 22: No. 22  $D_2^7$   $F222$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 23: No. 23  $D_2^8$   $I222$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 24: No. 24  $D_2^9$   $I2_12_12_1$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$



表 25: No. 25  $C_{2v}^1$   $Pmm2$  [ orthorhombic ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 26: No. 26  $C_{2v}^2$   $Pmc2_1$  [ orthorhombic ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 27: No. 27  $C_{2v}^3$   $Pcc2$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

表 28: No. 28  $C_{2v}^4$   $Pma2$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
④ $\{m_{100} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & -Z \end{pmatrix}$

表 29: No. 29  $C_{2v}^5$   $Pca2_1$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{m_{010} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
④ $\{m_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & \frac{1}{2} - Z \end{pmatrix}$

表 30: No. 30  $C_{2v}^6$   $Pnc2$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
④ $\{m_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

表 31: No. 31  $C_{2v}^7$   $Pmn2_1$  [ orthorhombic ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{m_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 32: No. 32  $C_{2v}^8$   $Pba2$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
④ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$



表 33: No. 33  $C_{2v}^9$   $Pna2_1$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
④ $\{m_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

表 34: No. 34  $C_{2v}^{10}$   $Pnn2$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
④ $\{m_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

表 35: No. 35  $C_{2v}^{11}$   $Cmm2$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 36: No. 36  $C_{2v}^{12}$   $Cmc2_1$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 37: No. 37  $C_{2v}^{13}$   $Ccc2$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

表 38: No. 38  $C_{2v}^{14}$   $Amm2$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 39: No. 39  $C_{2v}^{15}$   $Aem2$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$
④ $\{m_{100} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & -Z \end{pmatrix}$

表 40: No. 40  $C_{2v}^{16}$  *Ama2* [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② {2 <sub>001</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ {m <sub>010</sub>  \frac{1}{2}00}	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
④ {m <sub>100</sub>  \frac{1}{2}00}	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & -Z \end{pmatrix}$



表 41: No. 41  $C_{2v}^{17}$   $Aea2$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
④ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$

表 42: No. 42  $C_{2v}^{18}$   $Fmm2$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 43: No. 43  $C_{2v}^{19}$   $Fdd2$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & \frac{1}{4} - y & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & Y + \frac{1}{4} & \frac{1}{4} - Z \end{pmatrix}$
④ $\{m_{100} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - x & y + \frac{1}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{4} & \frac{1}{4} - Y & \frac{1}{4} - Z \end{pmatrix}$

表 44: No. 44  $C_{2v}^{20}$   $Imm2$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 45: No. 45  $C_{2v}^{21}$   $Iba2$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
④ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$

表 46: No. 46  $C_{2v}^{22}$   $Ima2$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{m_{010} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
④ $\{m_{100} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & -Z \end{pmatrix}$

表 47: No. 47  $D_{2h}^1$   $Pmmm$  [ orthorhombic ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 47

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑧ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$



表 48: No. 48  $D_{2h}^2$   $Pnnn$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & \frac{1}{2}-y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z \end{pmatrix}$
③ $\{2_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2}-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2}-Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 48

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑦ $\{m_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

表 49: No. 49  $D_{2h}^3$   $Pccm$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 49

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

表 50: No. 50  $D_{2h}^4$   $Pban$  [ orthorhombic ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{2_{010} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
④ $\{2_{100} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 50

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑦ $\{m_{010} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
⑧ $\{m_{100} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & -Z \end{pmatrix}$

表 51: No. 51  $D_{2h}^5$   $Pmma$  [ orthorhombic ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 51

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\mathbf{m}_{001} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z \end{pmatrix}$
⑦ $\{\mathbf{m}_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑧ $\{\mathbf{m}_{100} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & -Z \end{pmatrix}$



表 52: No. 52  $D_{2h}^6$   $Pnna$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z \end{pmatrix}$
③ $\{2_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

continued ...

表 52

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

表 53: No. 53  $D_{2h}^7$   $Pmna$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 53

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
⑦ $\{m_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 54: No. 54  $D_{2h}^8$   $Pcca$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & -y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 54

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & \frac{1}{2} - Z \end{pmatrix}$

表 55: No. 55  $D_{2h}^9$   $Pbam$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & Y+\frac{1}{2} & -Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & \frac{1}{2}-y & -z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 55

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$



表 56: No. 56  $D_{2h}^{10}$   $Pccn$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & \frac{1}{2}-y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & Y+\frac{1}{2} & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & -y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 56

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑦ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & \frac{1}{2} - Z \end{pmatrix}$

表 57: No. 57  $D_{2h}^{11}$   $Pbcm$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{100} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 57

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
⑦ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & -Z \end{pmatrix}$

表 58: No. 58  $D_{2h}^{12}$   $Pnnm$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y+\frac{1}{2} & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & Y+\frac{1}{2} & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & \frac{1}{2}-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 58

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

表 59: No. 59  $D_{2h}^{13}$   $Pmmn$  [ orthorhombic ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 59

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑦ $\{m_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & -Z \end{pmatrix}$



表 60: No. 60  $D_{2h}^{14}$   $Pbcn$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

continued ...

表 60

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z + \frac{1}{2} \end{pmatrix}$
⑦ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$

表 61: No. 61  $D_{2h}^{15}$   $Pbca$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & -Y & Z+\frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & Y+\frac{1}{2} & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & \frac{1}{2}-y & -z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 61

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
⑦ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$

表 62: No. 62  $D_{2h}^{16}$   $Pnma$  [ orthorhombic ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

continued ...

表 62

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
⑦ $\{m_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

表 63: No. 63  $D_{2h}^{17}$   $Cmcm$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 63

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
⑦ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$



表 64: No. 64  $D_{2h}^{18}$   $Cmce$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & \frac{1}{2} - Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 64

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & \frac{1}{2} - Y & Z + \frac{1}{2} \end{pmatrix}$
⑦ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 65: No. 65  $D_{2h}^{19}$   $Cmmm$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 65

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑧ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 66: No. 66  $D_{2h}^{20}$   $Cccm$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

continued ...

表 66

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

表 67: No. 67  $D_{2h}^{21}$   $Cmme$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & \frac{1}{2}-y & z \end{pmatrix}$	$\begin{pmatrix} -X & \frac{1}{2}-Y & Z \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y+\frac{1}{2} & -Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

continued ...

表 67

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\mathbf{m}_{001} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} -X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑦ $\{\mathbf{m}_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑧ $\{\mathbf{m}_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$



表 68: No. 68  $D_{2h}^{22}$   $Ccce$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & -y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 68

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & \frac{1}{2} - Z \end{pmatrix}$

表 69: No. 69  $D_{2h}^{23}$   $Fmmm$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 69

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑧ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 70: No. 70  $D_{2h}^{24}$   $Fddd$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{3}{4}\frac{3}{4}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-x & \frac{3}{4}-y & z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-X & \frac{3}{4}-Y & Z \end{pmatrix}$
③ $\{2_{010} \frac{3}{4}0\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-x & y & \frac{3}{4}-z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-X & Y & \frac{3}{4}-Z \end{pmatrix}$
④ $\{2_{100} 0\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x & \frac{3}{4}-y & \frac{3}{4}-z \end{pmatrix}$	$\begin{pmatrix} X & \frac{3}{4}-Y & \frac{3}{4}-Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 70

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{4}\frac{1}{4}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & y + \frac{1}{4} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & \frac{1}{4} - Y & Z \end{pmatrix}$
⑦ $\{m_{010} \frac{1}{4}0\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & -y & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & Y & \frac{1}{4} - Z \end{pmatrix}$
⑧ $\{m_{100} 0\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{4} - Y & \frac{1}{4} - Z \end{pmatrix}$

表 71: No. 71  $D_{2h}^{25}$   $Immm$  [ orthorhombic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 71

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑧ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$



表 72: No. 72  $D_{2h}^{26}$   $Ibam$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & Y+\frac{1}{2} & -Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & \frac{1}{2}-y & -z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

continued ...

表 72

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$

表 73: No. 73  $D_{2h}^{27}$   $Ibca$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & -Y & Z+\frac{1}{2} \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & Y+\frac{1}{2} & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & \frac{1}{2}-y & -z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 73

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
⑦ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$

表 74: No. 74  $D_{2h}^{28}$   $Imma$  [ orthorhombic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & \frac{1}{2}-y & z \end{pmatrix}$	$\begin{pmatrix} -X & \frac{1}{2}-Y & Z \end{pmatrix}$
③ $\{2_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y+\frac{1}{2} & -Z \end{pmatrix}$
④ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

continued ...

表 74

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} -X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑦ $\{m_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑧ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

表 75: No. 75  $C_4^1$   $P4$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 76: No. 76  $C_4^2$   $P4_1$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{4_{001}^+ 00\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{4} \end{pmatrix}$
④ $\{4_{001}^- 00\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{3}{4} \end{pmatrix}$



表 77: No. 77  $C_4^3$   $P4_2$  [ tetragonal ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
④ $\{4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$

表 78: No. 78  $C_4^4$   $P4_3$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{4_{001}^+ 00\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{3}{4} \end{pmatrix}$
④ $\{4_{001}^- 00\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{4} \end{pmatrix}$

表 79: No. 79  $C_4^5$   $I4$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 80: No. 80  $C_4^6 I4_1$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{4_{001}^+ 0\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -Y & X + \frac{1}{2} & Z + \frac{1}{4} \end{pmatrix}$
④ $\{4_{001}^- \frac{1}{2}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & -X & Z + \frac{3}{4} \end{pmatrix}$

表 81: No. 81  $S_4^1$   $P-4$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 82: No. 82  $S_4^2$   $I = 4$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 83: No. 83  $C_{4h}^1$   $P4/m$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 83

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$



表 84: No. 84  $C_{4h}^2$   $P4_2/m$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
④ $\{4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 84

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑧ $\{-4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$

表 85: No. 85  $C_{4h}^3$   $P4/n$  [ tetragonal ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 85

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑦ $\{-4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z \end{pmatrix}$

表 86: No. 86  $C_{4h}^4$   $P4_2/n$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
④ $\{4_{001}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & -X & Z + \frac{1}{2} \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 86

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
⑧ $\{-4_{001}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & -X & Z + \frac{1}{2} \end{pmatrix}$

表 87: No. 87  $C_{4h}^5$   $I4/m$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 87

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$



表 88: No. 88  $C_{4h}^6$   $I4_1/a$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & -Y & Z+\frac{1}{2} \end{pmatrix}$
③ $\{4_{001}^+ \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-y & x+\frac{1}{4} & z+\frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-Y & X+\frac{1}{4} & Z+\frac{1}{4} \end{pmatrix}$
④ $\{4_{001}^- \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y+\frac{3}{4} & \frac{3}{4}-x & z+\frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y+\frac{3}{4} & \frac{3}{4}-X & Z+\frac{3}{4} \end{pmatrix}$
⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$

*continued ...*

表 88

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
⑦ $\{-4^+_{001} \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & \frac{3}{4} - x & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & X + \frac{3}{4} & Z + \frac{3}{4} \end{pmatrix}$
⑧ $\{-4^-_{001} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & x + \frac{1}{4} & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & \frac{1}{4} - X & Z + \frac{1}{4} \end{pmatrix}$

表 89: No. 89  $D_4^1$   $P422$  [ tetragonal ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 89

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 90: No. 90  $D_4^2$   $P42_12$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 90

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z \end{pmatrix}$
⑧ $\{4_{001}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z \end{pmatrix}$

表 91: No. 91  $D_4^3$   $P4_122$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{3}{4} - Z \end{pmatrix}$

*continued ...*

表 91

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 00\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{4} - Z \end{pmatrix}$
⑦ $\{4_{001}^+ 00\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{4} \end{pmatrix}$
⑧ $\{4_{001}^- 00\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{3}{4} \end{pmatrix}$



表 92: No. 92  $D_4^4$   $P4_12_12$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{3}{4} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{4} - Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 92

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{4} \end{pmatrix}$
⑧ $\{4_{001}^- \frac{1}{2}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{3}{4} \end{pmatrix}$

表 93: No. 93  $D_4^5$   $P4_222$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 93

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑧ $\{4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$

表 94: No. 94  $D_4^6$   $P4_22_12$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 94

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
⑧ $\{4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$

表 95: No. 95  $D_4^7$   $P4_322$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{4} - Z \end{pmatrix}$

*continued ...*

表 95

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 00\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{3}{4}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{3}{4}-Z \end{pmatrix}$
⑦ $\{4_{001}^+ 00\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -y & x & z+\frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z+\frac{3}{4} \end{pmatrix}$
⑧ $\{4_{001}^- 00\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y & -x & z+\frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z+\frac{1}{4} \end{pmatrix}$



表 96: No. 96  $D_4^8$   $P4_32_12$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{4} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{3}{4} - Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

continued ...

表 96

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{3}{4} \end{pmatrix}$
⑧ $\{4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{4} \end{pmatrix}$

表 97: No. 97  $D_4^9$   $I422$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 97

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 98: No. 98  $D_4^{10}$   $I4_122$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} 0\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{4} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}0\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{3}{4} - Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 98

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ 0\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -Y & X + \frac{1}{2} & Z + \frac{1}{4} \end{pmatrix}$
⑧ $\{4_{001}^- \frac{1}{2}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & -X & Z + \frac{3}{4} \end{pmatrix}$

表 99: No. 99  $C_{4v}^1$   $P4mm$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑤ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

*continued ...*

表 99

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\mathbf{m}_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑦ $\{\mathbf{m}_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑧ $\{\mathbf{m}_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$



表 100: No. 100  $C_{4v}^2$   $P4bm$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑤ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y+\frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & -Z \end{pmatrix}$

*continued ...*

表 100

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑦ $\{m_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & -Z \end{pmatrix}$
⑧ $\{m_{1-10} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & -Z \end{pmatrix}$

表 101: No. 101  $C_{4v}^3$   $P4_2cm$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
④ $\{4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$
⑤ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 101

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑧ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$

表 102: No. 102  $C_{4v}^4$   $P4_2nm$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
④ $\{4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
⑤ $\{m_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 102

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑧ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$

表 103: No. 103  $C_{4v}^5$   $P4cc$  [tetragonal]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑤ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 103

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$



表 104: No. 104  $C_{4v}^6$   $P4nc$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑤ $\{m_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 104

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$

表 105: No. 105  $C_{4v}^7$   $P4_2mc$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
④ $\{4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$
⑤ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

*continued ...*

表 105

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑦ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$

表 106: No. 106  $C_{4v}^8$   $P4_2bc$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
④ $\{4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$
⑤ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$

continued ...

表 106

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑦ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$

表 107: No. 107  $C_{4v}^9$   $I4mm$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑤ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

*continued ...*

表 107

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\mathbf{m}_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑦ $\{\mathbf{m}_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑧ $\{\mathbf{m}_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$



表 108: No. 108  $C_{4v}^{10}$   $I4cm$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑤ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 108

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$
⑧ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$

表 109: No. 109  $C_{4v}^{11}$   $I4_1md$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{4_{001}^+ 0\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -Y & X + \frac{1}{2} & Z + \frac{1}{4} \end{pmatrix}$
④ $\{4_{001}^- \frac{1}{2}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & -X & Z + \frac{3}{4} \end{pmatrix}$
⑤ $\{m_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 109

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑦ $\{m_{110} 0\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -y & \frac{1}{2} - x & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Y & X + \frac{1}{2} & \frac{1}{4} - Z \end{pmatrix}$
⑧ $\{m_{1-10} \frac{1}{2}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & -X & \frac{3}{4} - Z \end{pmatrix}$

表 110: No. 110  $C_{4v}^{12}$   $I4_1cd$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & \frac{1}{2}-y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z+\frac{1}{2} \end{pmatrix}$
③ $\{4_{001}^+ 0\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -y & x+\frac{1}{2} & z+\frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -Y & X+\frac{1}{2} & Z+\frac{1}{4} \end{pmatrix}$
④ $\{4_{001}^- \frac{1}{2}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y+\frac{1}{2} & -x & z+\frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{2} & -X & Z+\frac{3}{4} \end{pmatrix}$
⑤ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y+\frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & -Z \end{pmatrix}$

continued ...

表 110

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{m_{110} 0\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -y & \frac{1}{2} - x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y & X + \frac{1}{2} & \frac{3}{4} - Z \end{pmatrix}$
⑧ $\{m_{1-10} \frac{1}{2}0\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & -X & \frac{1}{4} - Z \end{pmatrix}$

表 111: No. 111  $D_{2d}^1$   $P-42m$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 111

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\mathbf{m}_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$



表 112: No. 112  $D_{2d}^2$   $P-42c$  [tetragonal]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$

*continued ...*

表 112

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\mathbf{m}_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 113: No. 113  $D_{2d}^3$   $P-42_1m$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑤ $\{m_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & -Z \end{pmatrix}$

*continued ...*

表 113

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{1-10} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & -Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 114: No. 114  $D_{2d}^4$   $P-42_1c$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 114

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 115: No. 115  $D_{2d}^5$   $P-4m2$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
④ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑤ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

*continued ...*

表 115

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$



表 116: No. 116  $D_{2d}^6$   $P-4c2$  [tetragonal]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 116

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 117: No. 117  $D_{2d}^7$   $P-4b2$  [tetragonal]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & -Z \end{pmatrix}$
④ $\{2_{1-10} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & -Z \end{pmatrix}$
⑤ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$

*continued ...*

表 117

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 118: No. 118  $D_{2d}^8$   $P-4n2$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{m_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 118

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 119: No. 119  $D_{2d}^9$   $I - 4m2$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
④ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑤ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

*continued ...*

表 119

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$



表 120: No. 120  $D_{2d}^{10}$   $I - 4c2$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 120

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 121: No. 121  $D_{2d}^{11}$   $I - 42m$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 121

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\mathbf{m}_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 122: No. 122  $D_{2d}^{12}$   $I - 42d$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}0\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & \frac{3}{4} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}0\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{3}{4} - Z \end{pmatrix}$
⑤ $\{m_{110} \frac{1}{2}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & -x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X & \frac{3}{4} - Z \end{pmatrix}$

continued ...

表 122

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{1-10} \frac{1}{2}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & -X & \frac{3}{4} - Z \end{pmatrix}$
⑦ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 123: No. 123  $D_{4h}^1$   $P4/mmm$  [tetragonal]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 123

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

continued ...



表 123

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑬ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑭ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑮ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑯ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 124: No. 124  $D_{4h}^2$   $P4/mcc$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 124

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 124

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑬ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$
⑭ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑮ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑯ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 125: No. 125  $D_{4h}^3$   $P4/nbm$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{2_{100} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 125

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-x & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & x & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2}-x & z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2}-X & Z \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & y+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z \end{pmatrix}$
⑪ $\{m_{100} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2}-Y & -Z \end{pmatrix}$

continued ...

表 125

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
⑬ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑭ $\{m_{1-10} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & -Z \end{pmatrix}$
⑮ $\{-4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z \end{pmatrix}$
⑯ $\{-4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z \end{pmatrix}$

表 126: No. 126  $D_{4h}^4$   $P4/nnc$  [tetragonal] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{2_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*



表 126

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-X & \frac{1}{2}-Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & x & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2}-x & z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2}-X & Z \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & y+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z \end{pmatrix}$
⑪ $\{m_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2}-Y & \frac{1}{2}-Z \end{pmatrix}$

continued ...

表 126

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑬ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$
⑭ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑮ $\{-4^+_{001} \frac{1}{2}00\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z \end{pmatrix}$
⑯ $\{-4^-_{001} 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z \end{pmatrix}$

表 127: No. 127  $D_{4h}^5$   $P4/mbm$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & -Z \end{pmatrix}$

*continued ...*

表 127

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-x & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y+\frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & -Z \end{pmatrix}$

continued ...

表 127

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑬ $\{m_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & -Z \end{pmatrix}$
⑭ $\{m_{1-10} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & -Z \end{pmatrix}$
⑮ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑯ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 128: No. 128  $D_{4h}^6$   $P4/mnc$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 128

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-X & \frac{1}{2}-Z \end{pmatrix}$
⑦ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{m_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y+\frac{1}{2} & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & \frac{1}{2}-Z \end{pmatrix}$

continued ...

表 128

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑬ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑭ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑮ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑯ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$



表 129: No. 129  $D_{4h}^7$   $P4/nmm$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & \frac{1}{2}-y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & -y & -z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y+\frac{1}{2} & -Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y+\frac{1}{2} & x+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{2} & X+\frac{1}{2} & -Z \end{pmatrix}$

*continued ...*

表 129

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑪ $\{m_{100} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & -Z \end{pmatrix}$

continued ...

表 129

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑬ $\{m_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & -Z \end{pmatrix}$
⑭ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑮ $\{-4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z \end{pmatrix}$
⑯ $\{-4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z \end{pmatrix}$

表 130: No. 130  $D_{4h}^8$   $P4/ncc$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 130

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑪ $\{m_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 130

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑬ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑭ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑮ $\{-4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z \end{pmatrix}$
⑯ $\{-4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z \end{pmatrix}$

表 131: No. 131  $D_{4h}^9$   $P4_2/mmc$  [tetragonal]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 131

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑧ $\{4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

continued ...



表 131

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑬ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$
⑭ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑮ $\{-4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑯ $\{-4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$

表 132: No. 132  $D_{4h}^{10}$   $P4_2/mcm$  [tetragonal]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 132

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑧ $\{4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 132

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑬ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑭ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑮ $\{-4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑯ $\{-4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$

表 133: No. 133  $D_{4h}^{11}$   $P4_2/nbc$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{2_{100} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 133

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-X & \frac{1}{2}-Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & X & Z+\frac{1}{2} \end{pmatrix}$
⑧ $\{4_{001}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2}-x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2}-X & Z+\frac{1}{2} \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & y+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z \end{pmatrix}$
⑪ $\{m_{100} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2}-Y & -Z \end{pmatrix}$

continued ...

表 133

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
⑬ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$
⑭ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑮ $\{-4_{001}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑯ $\{-4_{001}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$

表 134: No. 134  $D_{4h}^{12}$   $P4_2/nnm$  [ tetragonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{2_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*



表 134

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-x & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & X & Z+\frac{1}{2} \end{pmatrix}$
⑧ $\{4_{001}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2}-x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2}-X & Z+\frac{1}{2} \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & y+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z \end{pmatrix}$
⑪ $\{m_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2}-Y & \frac{1}{2}-Z \end{pmatrix}$

continued ...

表 134

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑬ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑭ $\{m_{1-10} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & -Z \end{pmatrix}$
⑮ $\{-4_{001}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑯ $\{-4_{001}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$

表 135: No. 135  $D_{4h}^{13}$   $P4_2/mbc$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 135

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-X & \frac{1}{2}-Z \end{pmatrix}$
⑦ $\{4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑧ $\{4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2}-Y & -Z \end{pmatrix}$

continued ...

表 135

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑬ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑭ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑮ $\{-4_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑯ $\{-4_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z + \frac{1}{2} \end{pmatrix}$

表 136: No. 136  $D_{4h}^{14}$   $P4_2/mnm$  [tetragonal]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 136

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
⑧ $\{4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{m_{100} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 136

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑬ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑭ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑮ $\{-4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
⑯ $\{-4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$



表 137: No. 137  $D_{4h}^{15}$   $P4_2/nmc$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 137

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑧ $\{4_{001}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑪ $\{m_{100} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & -Z \end{pmatrix}$

continued ...

表 137

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2}-y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y+\frac{1}{2} & -Z \end{pmatrix}$
⑬ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{2} & X+\frac{1}{2} & \frac{1}{2}-Z \end{pmatrix}$
⑭ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2}-Z \end{pmatrix}$
⑮ $\{-4_{001}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y+\frac{1}{2} & -x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & X & Z+\frac{1}{2} \end{pmatrix}$
⑯ $\{-4_{001}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x+\frac{1}{2} & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2}-X & Z+\frac{1}{2} \end{pmatrix}$

表 138: No. 138  $D_{4h}^{16}$   $P4_2/nm$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & \frac{1}{2}-y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & -y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & -Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & Y+\frac{1}{2} & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y+\frac{1}{2} & x+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{2} & X+\frac{1}{2} & -Z \end{pmatrix}$

*continued ...*

表 138

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑧ $\{4_{001}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑪ $\{m_{100} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 138

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑬ $\{m_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & -Z \end{pmatrix}$
⑭ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑮ $\{-4_{001}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z + \frac{1}{2} \end{pmatrix}$
⑯ $\{-4_{001}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$

表 139: No. 139  $D_{4h}^{17}$   $I4/mmm$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 139

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑦ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

continued ...



表 139

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑬ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑭ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑮ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑯ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 140: No. 140  $D_{4h}^{18}$   $I4/mcm$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 140

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑦ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑧ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 140

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑬ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$
⑭ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$
⑮ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑯ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$

表 141: No. 141  $D_{4h}^{19}$   $I4_1/amd$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & x + \frac{3}{4} & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & X + \frac{3}{4} & \frac{1}{4} - Z \end{pmatrix}$

*continued ...*

表 141

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-y & \frac{1}{4}-x & \frac{3}{4}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-Y & \frac{1}{4}-X & \frac{3}{4}-Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-y & x+\frac{3}{4} & z+\frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-Y & X+\frac{3}{4} & Z+\frac{1}{4} \end{pmatrix}$
⑧ $\{4_{001}^- \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y+\frac{1}{4} & \frac{1}{4}-x & z+\frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{4} & \frac{1}{4}-X & Z+\frac{3}{4} \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & -Y & Z+\frac{1}{2} \end{pmatrix}$
⑪ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$

continued ...

表 141

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑬ $\{m_{110} \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & \frac{1}{4} - x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & X + \frac{1}{4} & \frac{3}{4} - Z \end{pmatrix}$
⑭ $\{m_{1-10} \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & x + \frac{3}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & \frac{3}{4} - X & \frac{1}{4} - Z \end{pmatrix}$
⑮ $\{-4_{001}^+ \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & \frac{1}{4} - x & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & X + \frac{1}{4} & Z + \frac{3}{4} \end{pmatrix}$
⑯ $\{-4_{001}^- \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & x + \frac{3}{4} & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & \frac{3}{4} - X & Z + \frac{1}{4} \end{pmatrix}$

表 142: No. 142  $D_{4h}^{20}$   $I4_1/acd$  [ tetragonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & -y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & x + \frac{3}{4} & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & X + \frac{3}{4} & \frac{3}{4} - Z \end{pmatrix}$

*continued ...*



表 142

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{1-10} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-y & \frac{1}{4}-x & \frac{1}{4}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-Y & \frac{1}{4}-X & \frac{1}{4}-Z \end{pmatrix}$
⑦ $\{4_{001}^+ \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-y & x+\frac{3}{4} & z+\frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-Y & X+\frac{3}{4} & Z+\frac{1}{4} \end{pmatrix}$
⑧ $\{4_{001}^- \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y+\frac{1}{4} & \frac{1}{4}-x & z+\frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{4} & \frac{1}{4}-X & Z+\frac{3}{4} \end{pmatrix}$
⑨ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑩ $\{m_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & -Y & Z+\frac{1}{2} \end{pmatrix}$
⑪ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & -Y & \frac{1}{2}-Z \end{pmatrix}$

continued ...

表 142

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{010} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & -Z \end{pmatrix}$
⑬ $\{m_{110} \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & \frac{1}{4} - x & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & X + \frac{1}{4} & \frac{1}{4} - Z \end{pmatrix}$
⑭ $\{m_{1-10} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & x + \frac{3}{4} & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & \frac{3}{4} - X & \frac{3}{4} - Z \end{pmatrix}$
⑮ $\{-4_{001}^+ \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & \frac{1}{4} - x & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & X + \frac{1}{4} & Z + \frac{3}{4} \end{pmatrix}$
⑯ $\{-4_{001}^- \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & x + \frac{3}{4} & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & \frac{3}{4} - X & Z + \frac{1}{4} \end{pmatrix}$

表 143: No. 143  $C_3^1$   $P3$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$

表 144: No. 144  $C_3^2$   $P3_1$  [ trigonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{1}{3} \end{pmatrix}$
③ $\{3_{001}^- 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{2}{3} \end{pmatrix}$

表 145: No. 145  $C_3^3$   $P3_2$  [ trigonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{2}{3} \end{pmatrix}$
③ $\{3_{001}^- 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{1}{3} \end{pmatrix}$

表 146: No. 146  $C_3^4 R3$  [ trigonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{2}{3} & \frac{1}{3} & \frac{1}{3} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{3} & \frac{2}{3} & \frac{2}{3} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$

表 147: No. 147  $C_{3i}^1$   $P-3$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
④ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑤ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 147

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$



表 148: No. 148  $C_{3i}^2$   $R = 3$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} \frac{2}{3} & \frac{1}{3} & \frac{1}{3} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{3} & \frac{2}{3} & \frac{2}{3} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
④ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑤ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 148

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$

表 149: No. 149  $D_3^1$   $P312$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{120} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
③ $\{2_{210} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & -z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
④ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 149

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$

表 150: No. 150  $D_3^2$   $P321$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
④ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 150

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$

表 151: No. 151  $D_3^3$   $P3_112$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{120} 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & \frac{1}{3}-z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{3}-Z \end{pmatrix}$
③ $\{2_{210} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & -z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
④ $\{2_{1-10} 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{2}{3}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{2}{3}-Z \end{pmatrix}$
⑤ $\{3_{001}^+ 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{1}{3} \end{pmatrix}$

*continued ...*

表 151

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{2}{3} \end{pmatrix}$



表 152: No. 152  $D_3^4$   $P3_121$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{100} 00\frac{2}{3}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & \frac{2}{3}-z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{2}{3}-Z \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & \frac{1}{3}-z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{3}-Z \end{pmatrix}$
④ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{1}{3} \end{pmatrix}$

*continued ...*

表 152

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{2}{3} \end{pmatrix}$

表 153: No. 153  $D_3^5$   $P3_212$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{120} 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & \frac{2}{3}-z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{2}{3}-Z \end{pmatrix}$
③ $\{2_{210} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & -z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
④ $\{2_{1-10} 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{3}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{3}-Z \end{pmatrix}$
⑤ $\{3_{001}^+ 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{2}{3} \end{pmatrix}$

continued ...

表 153

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{1}{3} \end{pmatrix}$

表 154: No. 154  $D_3^6$   $P3_221$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{100} 00\frac{1}{3}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & \frac{1}{3}-z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{3}-Z \end{pmatrix}$
③ $\{2_{010} 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & \frac{2}{3}-z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{2}{3}-Z \end{pmatrix}$
④ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{2}{3} \end{pmatrix}$

*continued ...*

表 154

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{1}{3} \end{pmatrix}$

表 155: No. 155  $D_3^7$   $R32$  [ trigonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{2}{3} & \frac{1}{3} & \frac{1}{3} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{3} & \frac{2}{3} & \frac{2}{3} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② {2 <sub>100</sub>  0}	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
③ {2 <sub>010</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
④ {2 <sub>110</sub>  0}	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑤ {3 <sup>+</sup> <sub>001</sub>  0}	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

continued ...

表 155

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$



表 156: No. 156  $C_{3v}^1$   $P3m1$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
④ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
⑤ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$

*continued ...*

表 156

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\mathbf{m}_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

表 157: No. 157  $C_{3v}^2$   $P31m$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
④ $\{m_{120} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑤ $\{m_{210} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$

*continued ...*

表 157

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$

表 158: No. 158  $C_{3v}^3$   $P3c1$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
④ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$

continued ...

表 158

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\text{m}_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

表 159: No. 159  $C_{3v}^4$   $P31c$  [ trigonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
④ $\{m_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{m_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$

*continued ...*

表 159

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$



表 160: No. 160  $C_{3v}^5$   $R3m$  [ trigonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{2}{3} & \frac{1}{3} & \frac{1}{3} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{3} & \frac{2}{3} & \frac{2}{3} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
④ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
⑤ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$

*continued ...*

表 160

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\mathbf{m}_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

表 161: No. 161  $C_{3v}^6$   $R3c$  [ trigonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{2}{3} & \frac{1}{3} & \frac{1}{3} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{3} & \frac{2}{3} & \frac{2}{3} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
④ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$

*continued ...*

表 161

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{\text{m}_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

表 162: No. 162  $D_{3d}^1$   $P-31m$  [ trigonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{120} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
③ $\{2_{210} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & -z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
④ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 162

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑦ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑧ $\{m_{120} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑨ $\{m_{210} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
⑩ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑪ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

continued ...

表 162

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$

表 163: No. 163  $D_{3d}^2$   $P-31c$  [trigonal]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
③ $\{2_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

continued ...



表 163

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑦ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑧ $\{m_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{m_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$
⑩ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2}-Z \end{pmatrix}$
⑪ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

continued ...

表 163

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$

表 164: No. 164  $D_{3d}^3$   $P-3m1$  [ trigonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
④ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 164

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑦ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑧ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
⑨ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
⑩ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑪ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

continued ...

表 164

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$

表 165: No. 165  $D_{3d}^4$   $P-3c1$  [trigonal]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

continued ...

表 165

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑦ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑧ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$
⑩ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$
⑪ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

continued ...

表 165

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$



表 166: No. 166  $D_{3d}^5$   $R - 3m$  [ trigonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{2}{3} & \frac{1}{3} & \frac{1}{3} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{3} & \frac{2}{3} & \frac{2}{3} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
④ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 166

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑦ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑧ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
⑨ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
⑩ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑪ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

continued ...

表 166

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$

表 167: No. 167  $D_{3d}^6$   $R - 3c$  [ trigonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{2}{3} & \frac{1}{3} & \frac{1}{3} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{3} & \frac{2}{3} & \frac{2}{3} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
③ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

continued ...

表 167

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑦ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑧ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$
⑩ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$
⑪ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

continued ...

表 167

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$

表 168: No. 168  $C_6^1$   $P6$  [ hexagonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
④ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑤ $\{6_{001}^+ 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

*continued ...*

表 168

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$



表 169: No. 169  $C_6^2$   $P6_1$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{3_{001}^+ 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x - y & z + \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X - Y & Z + \frac{1}{3} \end{pmatrix}$
④ $\{3_{001}^- 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x + y & -x & z + \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -X + Y & -X & Z + \frac{2}{3} \end{pmatrix}$
⑤ $\{6_{001}^+ 00\frac{1}{6}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} x - y & x & z + \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} X - Y & X & Z + \frac{1}{6} \end{pmatrix}$

*continued ...*

表 169

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 00\frac{5}{6}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{5}{6} \end{pmatrix}$

表 170: No. 170  $C_6^3$   $P6_5$  [ hexagonal ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{3_{001}^+ 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x - y & z + \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X - Y & Z + \frac{2}{3} \end{pmatrix}$
④ $\{3_{001}^- 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x + y & -x & z + \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -X + Y & -X & Z + \frac{1}{3} \end{pmatrix}$
⑤ $\{6_{001}^+ 00\frac{5}{6}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} x - y & x & z + \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} X - Y & X & Z + \frac{5}{6} \end{pmatrix}$

*continued ...*

表 170

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 00\frac{1}{6}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{6} \end{pmatrix}$

表 171: No. 171  $C_6^4$   $P6_2$  [ hexagonal ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{3_{001}^+ 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{2}{3} \end{pmatrix}$
④ $\{3_{001}^- 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{1}{3} \end{pmatrix}$
⑤ $\{6_{001}^+ 00\frac{1}{3}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} x-y & x & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{3} \end{pmatrix}$

*continued ...*

表 171

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{2}{3} \end{pmatrix}$

表 172: No. 172  $C_6^5$   $P6_4$  [ hexagonal ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{3_{001}^+ 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{1}{3} \end{pmatrix}$
④ $\{3_{001}^- 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{2}{3} \end{pmatrix}$
⑤ $\{6_{001}^+ 00\frac{2}{3}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} x-y & x & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{2}{3} \end{pmatrix}$

*continued ...*

表 172

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{3} \end{pmatrix}$



表 173: No. 173  $C_6^6$   $P6_3$  [ hexagonal ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x - y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X - Y & Z \end{pmatrix}$
④ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x + y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X + Y & -X & Z \end{pmatrix}$
⑤ $\{6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x - y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X - Y & X & Z + \frac{1}{2} \end{pmatrix}$

*continued ...*

表 173

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$

表 174: No. 174  $C_{3h}^1$   $P-6$  [ hexagonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
③ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
④ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑤ $\{-6_{001}^+ 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

*continued ...*

表 174

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{-6_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$

表 175: No. 175  $C_{6h}^1$   $P6/m$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
④ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑤ $\{6_{001}^+ 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

*continued ...*

表 175

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$
⑦ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑧ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑨ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
⑩ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑪ $\{-6_{001}^+ 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

continued ...

表 175

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-6_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$

表 176: No. 176  $C_{6h}^2$   $P6_3/m$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x - y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X - Y & Z \end{pmatrix}$
④ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x + y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X + Y & -X & Z \end{pmatrix}$
⑤ $\{6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x - y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X - Y & X & Z + \frac{1}{2} \end{pmatrix}$

*continued ...*



表 176

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^{-} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$
⑦ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑧ $\{m_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z+\frac{1}{2} \end{pmatrix}$
⑨ $\{-3_{001}^{+} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
⑩ $\{-3_{001}^{-} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑪ $\{-6_{001}^{+} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{2} \end{pmatrix}$

continued ...

表 176

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$

表 177: No. 177  $D_6^1$   $P622$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 177

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{120} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑦ $\{2_{210} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & -z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
⑩ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑪ $\{6_{001}^+ 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

continued ...

表 177

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{6_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$

表 178: No. 178  $D_6^2$   $P6_122$  [ hexagonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x - y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X - Y & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x & -x + y & \frac{2}{3} - z \end{pmatrix}$	$\begin{pmatrix} -X & -X + Y & \frac{2}{3} - Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{3} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{3} - Z \end{pmatrix}$

*continued ...*

表 178

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑦ $\{2_{210} 00\frac{1}{6}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} x & x-y & \frac{1}{6}-z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{6}-Z \end{pmatrix}$
⑧ $\{2_{1-10} 00\frac{5}{6}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{5}{6}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{5}{6}-Z \end{pmatrix}$
⑨ $\{3_{001}^+ 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{1}{3} \end{pmatrix}$
⑩ $\{3_{001}^- 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{2}{3} \end{pmatrix}$
⑪ $\{6_{001}^+ 00\frac{1}{6}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} x-y & x & z+\frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{6} \end{pmatrix}$

continued ...

表 178

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{6_{001}^- 00\frac{5}{6}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{5}{6} \end{pmatrix}$



表 179: No. 179  $D_6^3$   $P6_522$  [ hexagonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x - y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X - Y & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x & -x + y & \frac{1}{3} - z \end{pmatrix}$	$\begin{pmatrix} -X & -X + Y & \frac{1}{3} - Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{2}{3} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{2}{3} - Z \end{pmatrix}$

*continued ...*

表 179

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑦ $\{2_{210} 00\frac{5}{6}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} x & x-y & \frac{5}{6}-z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{5}{6}-Z \end{pmatrix}$
⑧ $\{2_{1-10} 00\frac{1}{6}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{6}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{6}-Z \end{pmatrix}$
⑨ $\{3_{001}^+ 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{2}{3} \end{pmatrix}$
⑩ $\{3_{001}^- 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{1}{3} \end{pmatrix}$
⑪ $\{6_{001}^+ 00\frac{5}{6}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} x-y & x & z+\frac{5}{6} \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{5}{6} \end{pmatrix}$

continued ...

表 179

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{6_{001}^- 00\frac{1}{6}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{6} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{6} \end{pmatrix}$

表 180: No. 180  $D_6^4$   $P6_222$  [ hexagonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & \frac{1}{3}-z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{3}-Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{2}{3}-z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{2}{3}-Z \end{pmatrix}$

*continued ...*

表 180

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{120} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑦ $\{2_{210} 00\frac{1}{3}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} x & x-y & \frac{1}{3}-z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{3}-Z \end{pmatrix}$
⑧ $\{2_{1-10} 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{2}{3}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{2}{3}-Z \end{pmatrix}$
⑨ $\{3_{001}^+ 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{2}{3} \end{pmatrix}$
⑩ $\{3_{001}^- 00\frac{1}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{1}{3} \end{pmatrix}$
⑪ $\{6_{001}^+ 00\frac{1}{3}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} x-y & x & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{3} \end{pmatrix}$

continued ...

表 180

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{6_{001}^- 00\frac{2}{3}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{2}{3} \end{pmatrix}$

表 181: No. 181  $D_6^5$   $P6_422$  [ hexagonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & \frac{2}{3}-z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{2}{3}-Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{3}-z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{3}-Z \end{pmatrix}$

*continued ...*

表 181

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{120} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑦ $\{2_{210} 00\frac{2}{3}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} x & x-y & \frac{2}{3}-z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{2}{3}-Z \end{pmatrix}$
⑧ $\{2_{1-10} 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{3}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{3}-Z \end{pmatrix}$
⑨ $\{3_{001}^+ 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z+\frac{1}{3} \end{pmatrix}$
⑩ $\{3_{001}^- 00\frac{2}{3}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z+\frac{2}{3} \end{pmatrix}$
⑪ $\{6_{001}^+ 00\frac{2}{3}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} x-y & x & z+\frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{2}{3} \end{pmatrix}$

continued ...



表 181

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{6_{001}^- 00\frac{1}{3}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{3} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{3} \end{pmatrix}$

表 182: No. 182  $D_6^6$   $P6_322$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x - y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X - Y & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x + y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -X + Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 182

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑦ $\{2_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$
⑧ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
⑩ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑪ $\{6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{2} \end{pmatrix}$

continued ...

表 182

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$

表 183: No. 183  $C_{6v}^1$   $P6mm$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
④ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑤ $\{6_{001}^+ 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

*continued ...*

表 183

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$
⑦ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
⑧ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
⑨ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑩ $\{m_{120} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑪ $\{m_{210} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$

continued ...

表 183

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$

表 184: No. 184  $C_{6v}^2$   $P6cc$  [ hexagonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
④ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑤ $\{6_{001}^+ 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

*continued ...*



表 184

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$
⑦ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑧ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$
⑩ $\{m_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑪ $\{m_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$

continued ...

表 184

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$

表 185: No. 185  $C_{6v}^3$   $P6_3cm$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x - y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X - Y & Z \end{pmatrix}$
④ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x + y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X + Y & -X & Z \end{pmatrix}$
⑤ $\{6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x - y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X - Y & X & Z + \frac{1}{2} \end{pmatrix}$

*continued ...*

表 185

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$
⑦ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑧ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$
⑩ $\{m_{120} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑪ $\{m_{210} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$

continued ...

表 185

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$

表 186: No. 186  $C_{6v}^4$   $P6_3mc$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x - y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X - Y & Z \end{pmatrix}$
④ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x + y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X + Y & -X & Z \end{pmatrix}$
⑤ $\{6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x - y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X - Y & X & Z + \frac{1}{2} \end{pmatrix}$

*continued ...*

表 186

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$
⑦ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
⑧ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
⑨ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑩ $\{m_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑪ $\{m_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$

continued ...

表 186

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2} - Z \end{pmatrix}$



表 187: No. 187  $D_{3h}^1$   $P-6m2$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{120} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
③ $\{2_{210} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & -z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
④ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 187

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑦ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
⑧ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
⑨ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑩ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑪ $\{-6_{001}^+ 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

continued ...

表 187

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-6_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$

表 188: No. 188  $D_{3h}^2$   $P-6c2$  [ hexagonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{120} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
③ $\{2_{210} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & -z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
④ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 188

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑦ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑧ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$
⑩ $\{m_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z+\frac{1}{2} \end{pmatrix}$
⑪ $\{-6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{2} \end{pmatrix}$

continued ...

表 188

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$

表 189: No. 189  $D_{3h}^3$   $P-62m$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
④ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 189

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑦ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑧ $\{m_{120} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑨ $\{m_{210} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
⑩ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑪ $\{-6_{001}^+ 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

continued ...



表 189

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-6_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$

表 190: No. 190  $D_{3h}^4$   $P-62c$  [ hexagonal ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
③ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
④ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑤ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$

*continued ...*

表 190

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑦ $\{m_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z+\frac{1}{2} \end{pmatrix}$
⑧ $\{m_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{m_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$
⑩ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2}-Z \end{pmatrix}$
⑪ $\{-6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{2} \end{pmatrix}$

continued ...

表 190

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{-6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$

表 191: No. 191  $D_{6h}^1$   $P6/mmm$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 191

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{120} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑦ $\{2_{210} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & -z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
⑩ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑪ $\{6_{001}^+ 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

continued ...

表 191

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{6_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
⑮ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
⑯ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑰ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$

continued ...

表 191

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{m_{120} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑰ $\{m_{210} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
⑳ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
㉑ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
㉒ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
㉓ $\{-6_{001}^+ 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

continued ...



表 191

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-6_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$

表 192: No. 192  $D_{6h}^2$   $P6/mcc$  [ hexagonal ] +  $\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$

*continued ...*

表 192

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑦ $\{2_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$
⑧ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
⑩ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑪ $\{6_{001}^+ 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

continued ...

表 192

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{6_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑮ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$
⑯ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$
⑰ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$

continued ...

表 192

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{m_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑲ $\{m_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$
⑳ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2}-Z \end{pmatrix}$
㉑ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
㉒ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
㉓ $\{-6_{001}^+ 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z \end{pmatrix}$

continued ...

表 192

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-6_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z \end{pmatrix}$

表 193: No. 193  $D_{6h}^3$   $P6_3/mcm$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x - y & -y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X - Y & -Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x + y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & -X + Y & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 193

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{120} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑦ $\{2_{210} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & -z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
⑩ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑪ $\{6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{2} \end{pmatrix}$

continued ...



表 193

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{100} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & \frac{1}{2}-Z \end{pmatrix}$
⑮ $\{m_{010} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & \frac{1}{2}-Z \end{pmatrix}$
⑯ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2}-Z \end{pmatrix}$
⑰ $\{m_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z+\frac{1}{2} \end{pmatrix}$

continued ...

表 193

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{\mathbf{m}_{120} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & -Z \end{pmatrix}$
⑯ $\{\mathbf{m}_{210} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & -Z \end{pmatrix}$
⑳ $\{\mathbf{m}_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
㉑ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
㉒ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
㉓ $\{-6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{2} \end{pmatrix}$

continued ...

表 193

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$

表 194: No. 194  $D_{6h}^4$   $P6_3/mmc$  [ hexagonal ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & -y & -z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 194

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑦ $\{2_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & x-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$
⑧ $\{2_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{3_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x-y & z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
⑩ $\{3_{001}^- 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
⑪ $\{6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{2} \end{pmatrix}$

continued ...

表 194

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x+y & y & z \end{pmatrix}$	$\begin{pmatrix} X-Y & -Y & -Z \end{pmatrix}$
⑮ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & x-y & z \end{pmatrix}$	$\begin{pmatrix} -X & -X+Y & -Z \end{pmatrix}$
⑯ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑰ $\{m_{001} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z+\frac{1}{2} \end{pmatrix}$

continued ...

表 194

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{m_{120} 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x-y & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X+Y & Y & \frac{1}{2}-Z \end{pmatrix}$
⑯ $\{m_{210} 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -x+y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & X-Y & \frac{1}{2}-Z \end{pmatrix}$
⑳ $\{m_{1-10} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & -X & \frac{1}{2}-Z \end{pmatrix}$
㉑ $\{-3_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x+y & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X-Y & Z \end{pmatrix}$
㉒ $\{-3_{001}^- 0\}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x-y & x & -z \end{pmatrix}$	$\begin{pmatrix} -X+Y & -X & Z \end{pmatrix}$
㉓ $\{-6_{001}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x+y & -x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X-Y & X & Z+\frac{1}{2} \end{pmatrix}$

continued ...

表 194

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-6_{001}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} Y & -X+Y & Z+\frac{1}{2} \end{pmatrix}$



表 195: No. 195  $T^1$   $P23$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 195

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 195

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$

$$\begin{aligned} \text{表 196:} \quad & \text{No.} \quad 196 \quad T^2 \quad F23 \quad [ \text{cubic} ] \quad + \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, \\ & + \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}, \quad + \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}, \quad + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix} \end{aligned}$$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 196

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 196

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$

$$\begin{aligned} \text{表 197:} \quad & \text{No.} \quad 197 \quad T^3 \quad I23 \quad [ \text{cubic} ] \quad + \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, \\ & + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix} \end{aligned}$$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 197

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...



表 197

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$

表 198: No. 198  $T^4$   $P2_13$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 198

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & -x & y+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & -X & Y+\frac{1}{2} \end{pmatrix}$
⑦ $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z+\frac{1}{2} & \frac{1}{2}-x & -y \end{pmatrix}$	$\begin{pmatrix} Z+\frac{1}{2} & \frac{1}{2}-X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x+\frac{1}{2} & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} -Z & X+\frac{1}{2} & \frac{1}{2}-Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z+\frac{1}{2} & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} -Y & Z+\frac{1}{2} & \frac{1}{2}-X \end{pmatrix}$
⑪ $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & -z & x+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & -Z & X+\frac{1}{2} \end{pmatrix}$

continued ...

表 198

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - z & -x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - Z & -X \end{pmatrix}$

表 199: No. 199  $T^5 I2_13$  [ cubic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 199

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & -x & y+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & -X & Y+\frac{1}{2} \end{pmatrix}$
⑦ $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z+\frac{1}{2} & \frac{1}{2}-x & -y \end{pmatrix}$	$\begin{pmatrix} Z+\frac{1}{2} & \frac{1}{2}-X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x+\frac{1}{2} & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} -Z & X+\frac{1}{2} & \frac{1}{2}-Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z+\frac{1}{2} & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} -Y & Z+\frac{1}{2} & \frac{1}{2}-X \end{pmatrix}$
⑪ $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & -z & x+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & -Z & X+\frac{1}{2} \end{pmatrix}$

continued ...

表 199

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3^-_{-1-11} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - z & -x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - Z & -X \end{pmatrix}$

表 200: No. 200  $T_h^1$   $Pm-3$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*



表 200

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 200

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑮ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑯ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑰ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 200

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{-3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑯ $\{-3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑰ $\{-3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑱ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
㉑ $\{-3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
㉒ $\{-3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 200

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-3_{-1-11}^-[0]\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$

表 201: No. 201  $T_h^2$   $Pn-3$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & \frac{1}{2}-y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z \end{pmatrix}$
③ $\{2_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2}-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2}-Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 201

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & \frac{1}{2}-x & y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & \frac{1}{2}-X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z & \frac{1}{2}-x & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} Z & \frac{1}{2}-X & \frac{1}{2}-Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & x & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & X & \frac{1}{2}-Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & z & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & Z & \frac{1}{2}-X \end{pmatrix}$
⑪ $\{3_{-11-1}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-z & x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-Z & X \end{pmatrix}$

continued ...

表 201

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - z & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - Z & \frac{1}{2} - X \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
⑮ $\{m_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
⑯ $\{m_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑰ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 201

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{-3_{1-1-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & x + \frac{1}{2} & -y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - X & Y \end{pmatrix}$
⑰ $\{-3_{-11-1}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z & \frac{1}{2} - X & \frac{1}{2} - Y \end{pmatrix}$
⑳ $\{-3_{-1-11}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & -x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & X & \frac{1}{2} - Y \end{pmatrix}$
㉑ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
㉒ $\{-3_{1-1-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & Z & \frac{1}{2} - X \end{pmatrix}$
㉓ $\{-3_{-11-1}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & z + \frac{1}{2} & -x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - Z & X \end{pmatrix}$

continued ...



表 201

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
② <sub>4</sub> $\{-3_{-1-11}^- 0_{\frac{1}{2}\frac{1}{2}}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - Z & \frac{1}{2} - X \end{pmatrix}$

表 202: No. 202  $T_h^3 Fm - 3$  [ cubic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 202

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 202

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑮ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑯ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑰ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 202

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{-3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑯ $\{-3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑰ $\{-3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑱ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑳ $\{-3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
㉑ $\{-3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 202

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②4 $\{-3_{-1-11}^-[0]\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$

表 203: No. 203  $T_h^4 Fd - 3$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{3}{4}\frac{3}{4}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-x & \frac{3}{4}-y & z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-X & \frac{3}{4}-Y & Z \end{pmatrix}$
③ $\{2_{100} 0\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x & \frac{3}{4}-y & \frac{3}{4}-z \end{pmatrix}$	$\begin{pmatrix} X & \frac{3}{4}-Y & \frac{3}{4}-Z \end{pmatrix}$
④ $\{2_{010} \frac{3}{4}0\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-x & y & \frac{3}{4}-z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-X & Y & \frac{3}{4}-Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 203

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ \frac{3}{4}\frac{3}{4}0\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-z & \frac{3}{4}-x & y \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-Z & \frac{3}{4}-X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z & \frac{3}{4}-x & \frac{3}{4}-y \end{pmatrix}$	$\begin{pmatrix} Z & \frac{3}{4}-X & \frac{3}{4}-Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ \frac{3}{4}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-z & x & \frac{3}{4}-y \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-Z & X & \frac{3}{4}-Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- \frac{3}{4}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-y & z & \frac{3}{4}-x \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-Y & Z & \frac{3}{4}-X \end{pmatrix}$
⑪ $\{3_{-11-1}^- \frac{3}{4}\frac{3}{4}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-y & \frac{3}{4}-z & x \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-Y & \frac{3}{4}-Z & X \end{pmatrix}$

continued ...



表 203

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y & \frac{3}{4} - z & \frac{3}{4} - x \end{pmatrix}$	$\begin{pmatrix} Y & \frac{3}{4} - Z & \frac{3}{4} - X \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{001} \frac{1}{4}\frac{1}{4}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & y + \frac{1}{4} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & \frac{1}{4} - Y & Z \end{pmatrix}$
⑮ $\{m_{100} 0\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{4} - Y & \frac{1}{4} - Z \end{pmatrix}$
⑯ $\{m_{010} \frac{1}{4}0\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & -y & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & Y & \frac{1}{4} - Z \end{pmatrix}$
⑰ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 203

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{-3_{1-1-1}^+ \frac{1}{4}\frac{1}{4}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & x + \frac{1}{4} & -y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & \frac{1}{4} - X & Y \end{pmatrix}$
⑰ $\{-3_{-11-1}^+ 0\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -z & x + \frac{1}{4} & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Z & \frac{1}{4} - X & \frac{1}{4} - Y \end{pmatrix}$
⑳ $\{-3_{-1-11}^+ \frac{1}{4}0\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & -x & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & X & \frac{1}{4} - Y \end{pmatrix}$
㉑ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
㉒ $\{-3_{1-1-1}^- \frac{1}{4}0\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & -z & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & Z & \frac{1}{4} - X \end{pmatrix}$
㉓ $\{-3_{-11-1}^- \frac{1}{4}\frac{1}{4}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & z + \frac{1}{4} & -x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & \frac{1}{4} - Z & X \end{pmatrix}$

continued ...

表 203

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
② <sub>4</sub> $\{-3_{-1-11}^- 0_{\frac{1}{4}\frac{1}{4}}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -y & z + \frac{1}{4} & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{4} - Z & \frac{1}{4} - X \end{pmatrix}$

表 204: No. 204  $T_h^5$   $Im - 3$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 204

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 204

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
⑮ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
⑯ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑰ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 204

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{-3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑯ $\{-3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑰ $\{-3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑱ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑲ $\{-3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑳ $\{-3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 204

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②4 $\{-3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$



表 205: No. 205  $T_h^6$   $Pa-3$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & -y & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & -Y & Z+\frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & \frac{1}{2}-y & -z \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{2} & \frac{1}{2}-Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y+\frac{1}{2} & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} -X & Y+\frac{1}{2} & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 205

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & -x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & -X & Y + \frac{1}{2} \end{pmatrix}$
⑦ $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{1}{2} - x & -y \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x + \frac{1}{2} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} -Z & X + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z + \frac{1}{2} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} -Y & Z + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
⑪ $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & -z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & -Z & X + \frac{1}{2} \end{pmatrix}$

continued ...

表 205

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - z & -x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - Z & -X \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
⑮ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
⑯ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑰ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 205

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{-3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & x & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & -X & Y + \frac{1}{2} \end{pmatrix}$
⑰ $\{-3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & x + \frac{1}{2} & y \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - X & -Y \end{pmatrix}$
⑳ $\{-3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z & \frac{1}{2} - x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Z & X + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$
㉑ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
㉒ $\{-3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & Z + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
㉓ $\{-3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & z & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & -Z & X + \frac{1}{2} \end{pmatrix}$

continued ...

表 205

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-3_{-1-11}^{-} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & z+\frac{1}{2} & x \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{2} & \frac{1}{2}-Z & -X \end{pmatrix}$

表 206: No. 206  $T_h^7$   $Ia - 3$  [ cubic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 206

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & -x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & -X & Y + \frac{1}{2} \end{pmatrix}$
⑦ $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{1}{2} - x & -y \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x + \frac{1}{2} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} -Z & X + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z + \frac{1}{2} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} -Y & Z + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
⑪ $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & -z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & -Z & X + \frac{1}{2} \end{pmatrix}$

continued ...

表 206

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - z & -x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - Z & -X \end{pmatrix}$
⑬ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
⑭ $\{m_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
⑮ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
⑯ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑰ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...



表 206

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{-3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & x & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & -X & Y + \frac{1}{2} \end{pmatrix}$
⑰ $\{-3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & x + \frac{1}{2} & y \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - X & -Y \end{pmatrix}$
⑳ $\{-3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z & \frac{1}{2} - x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Z & X + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$
㉑ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
㉒ $\{-3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & Z + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
㉓ $\{-3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & z & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & -Z & X + \frac{1}{2} \end{pmatrix}$

continued ...

表 206

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-3_{-1-11}^{-} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & z+\frac{1}{2} & x \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{2} & \frac{1}{2}-Z & -X \end{pmatrix}$

表 207: No. 207  $O^1$   $P432$  [cubic]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 207

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
⑦ $\{2_{011} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{2_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
⑩ $\{2_{01-1} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 207

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑰ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 207

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑲ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑳ $\{4_{100}^+ 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
㉑ $\{4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
㉒ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
㉓ $\{4_{100}^- 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...

表 207

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
② <sub>4</sub> $\{4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$

表 208: No. 208  $O^2$   $P4_232$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*



表 208

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{1}{2} - y & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - Y & X + \frac{1}{2} \end{pmatrix}$
⑦ $\{2_{011} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & z + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Z + \frac{1}{2} & Y + \frac{1}{2} \end{pmatrix}$
⑧ $\{2_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑨ $\{2_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & \frac{1}{2} - y & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - Y & \frac{1}{2} - X \end{pmatrix}$
⑩ $\{2_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - z & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Z & \frac{1}{2} - Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 208

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑰ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 208

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑲ $\{4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
⑳ $\{4_{100}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - z & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Z & Y + \frac{1}{2} \end{pmatrix}$
㉑ $\{4_{010}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & y + \frac{1}{2} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & Y + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
㉒ $\{4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
㉓ $\{4_{100}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & z + \frac{1}{2} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & Z + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$

continued ...

表 208

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
② <sub>4</sub> $\{4^-_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & y+\frac{1}{2} & x+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & Y+\frac{1}{2} & X+\frac{1}{2} \end{pmatrix}$

$$\begin{aligned} \text{表 209:} \quad & \text{No.} \quad 209 \quad O^3 \quad F432 \quad [ \text{cubic} ] \quad + \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, \\ & + \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}, \quad + \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}, \quad + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix} \end{aligned}$$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 209

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
⑦ $\{2_{011} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{2_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
⑩ $\{2_{01-1} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 209

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑰ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 209

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑲ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑳ $\{4_{100}^+ 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
㉑ $\{4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
㉒ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
㉓ $\{4_{100}^- 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...



表 209

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
② <sub>4</sub> $\{4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$

$$\begin{aligned} \text{表 210: No. 210 } O^4 F4_132 \text{ [ cubic ] } &+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, \\ &+ \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}, + \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}, + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix} \end{aligned}$$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② {2 <sub>001</sub>  0 $\frac{1}{2}\frac{1}{2}$ }	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & \frac{1}{2} - Y & Z + \frac{1}{2} \end{pmatrix}$
③ {2 <sub>100</sub>   $\frac{1}{2}0\frac{1}{2}$ }	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Y & \frac{1}{2} - Z \end{pmatrix}$
④ {2 <sub>010</sub>   $\frac{1}{2}\frac{1}{2}0$ }	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y + \frac{1}{2} & -Z \end{pmatrix}$
⑤ {2 <sub>110</sub>   $\frac{3}{4}\frac{1}{4}\frac{3}{4}$ }	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & x + \frac{1}{4} & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & X + \frac{1}{4} & \frac{3}{4} - Z \end{pmatrix}$

continued ...

表 210

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & \frac{3}{4} - y & x + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{4} & \frac{3}{4} - Y & X + \frac{3}{4} \end{pmatrix}$
⑦ $\{2_{011} \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - x & z + \frac{3}{4} & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & Z + \frac{3}{4} & Y + \frac{1}{4} \end{pmatrix}$
⑧ $\{2_{1-10} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & \frac{1}{4} - x & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & \frac{1}{4} - X & \frac{1}{4} - Z \end{pmatrix}$
⑨ $\{2_{-101} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - z & \frac{1}{4} - y & \frac{1}{4} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & \frac{1}{4} - Y & \frac{1}{4} - X \end{pmatrix}$
⑩ $\{2_{01-1} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - x & \frac{1}{4} - z & \frac{1}{4} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & \frac{1}{4} - Z & \frac{1}{4} - Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 210

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & \frac{1}{2} - x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Z & \frac{1}{2} - X & Y + \frac{1}{2} \end{pmatrix}$
⑬ $\{3_{-11-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & -x & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & -X & \frac{1}{2} - Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & x + \frac{1}{2} & -y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & X + \frac{1}{2} & -Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & z + \frac{1}{2} & -x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & Z + \frac{1}{2} & -X \end{pmatrix}$
⑰ $\{3_{-11-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & \frac{1}{2} - z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & \frac{1}{2} - Z & X + \frac{1}{2} \end{pmatrix}$

continued ...

表 210

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -z & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & -Z & \frac{1}{2} - X \end{pmatrix}$
⑰ $\{4_{001}^+ \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & x + \frac{3}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & X + \frac{3}{4} & Z + \frac{1}{4} \end{pmatrix}$
⑳ $\{4_{100}^+ \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & \frac{3}{4} - z & y + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{4} & \frac{3}{4} - Z & Y + \frac{3}{4} \end{pmatrix}$
㉑ $\{4_{010}^+ \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{3}{4} & y + \frac{1}{4} & \frac{3}{4} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{3}{4} & Y + \frac{1}{4} & \frac{3}{4} - X \end{pmatrix}$
㉒ $\{4_{001}^- \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & \frac{3}{4} - x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & \frac{3}{4} - X & Z + \frac{3}{4} \end{pmatrix}$
㉓ $\{4_{100}^- \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & z + \frac{1}{4} & \frac{3}{4} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{3}{4} & Z + \frac{1}{4} & \frac{3}{4} - Y \end{pmatrix}$

continued ...

表 210

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
② <sub>4</sub> {4 <sup>-</sup> <sub>010</sub>   $\frac{3}{4}\frac{3}{4}\frac{1}{4}$ }	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - z & y + \frac{3}{4} & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Z & Y + \frac{3}{4} & X + \frac{1}{4} \end{pmatrix}$

$$\begin{aligned} \text{表 211:} \quad & \text{No.} \quad 211 \quad O^5 \quad I432 \quad [ \text{cubic} ] \quad + \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, \\ & + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix} \end{aligned}$$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 211

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
⑦ $\{2_{011} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{2_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
⑩ $\{2_{01-1} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...



表 211

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑰ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 211

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑲ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑳ $\{4_{100}^+ 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
㉑ $\{4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
㉒ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
㉓ $\{4_{100}^- 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...

表 211

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
② <sub>4</sub> $\{4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$

表 212: No. 212  $O^6$   $P4_332$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & x + \frac{3}{4} & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & X + \frac{3}{4} & \frac{3}{4} - Z \end{pmatrix}$

*continued ...*

表 212

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{3}{4} & \frac{3}{4} - y & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{3}{4} & \frac{3}{4} - Y & X + \frac{1}{4} \end{pmatrix}$
⑦ $\{2_{011} \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - x & z + \frac{1}{4} & y + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & Z + \frac{1}{4} & Y + \frac{3}{4} \end{pmatrix}$
⑧ $\{2_{1-10} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & \frac{1}{4} - x & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & \frac{1}{4} - X & \frac{1}{4} - Z \end{pmatrix}$
⑨ $\{2_{-101} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - z & \frac{1}{4} - y & \frac{1}{4} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & \frac{1}{4} - Y & \frac{1}{4} - X \end{pmatrix}$
⑩ $\{2_{01-1} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - x & \frac{1}{4} - z & \frac{1}{4} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & \frac{1}{4} - Z & \frac{1}{4} - Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 212

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & -x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & -X & Y + \frac{1}{2} \end{pmatrix}$
⑬ $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{1}{2} - x & -y \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x + \frac{1}{2} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} -Z & X + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z + \frac{1}{2} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} -Y & Z + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
⑰ $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & -z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & -Z & X + \frac{1}{2} \end{pmatrix}$

continued ...

表 212

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - z & -x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - Z & -X \end{pmatrix}$
⑰ $\{4_{001}^+ \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & x + \frac{1}{4} & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & X + \frac{1}{4} & Z + \frac{3}{4} \end{pmatrix}$
⑳ $\{4_{100}^+ \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & \frac{3}{4} - z & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{3}{4} & \frac{3}{4} - Z & Y + \frac{1}{4} \end{pmatrix}$
㉑ $\{4_{010}^+ \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & y + \frac{3}{4} & \frac{3}{4} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{4} & Y + \frac{3}{4} & \frac{3}{4} - X \end{pmatrix}$
㉒ $\{4_{001}^- \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & \frac{3}{4} - x & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & \frac{3}{4} - X & Z + \frac{1}{4} \end{pmatrix}$
㉓ $\{4_{100}^- \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & z + \frac{3}{4} & \frac{3}{4} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{4} & Z + \frac{3}{4} & \frac{3}{4} - Y \end{pmatrix}$

continued ...

表 212

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
② <sub>4</sub> {4 <sup>-</sup> <sub>010</sub>   $\frac{3}{4}\frac{1}{4}\frac{3}{4}$ }	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - z & y + \frac{1}{4} & x + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Z & Y + \frac{1}{4} & X + \frac{3}{4} \end{pmatrix}$



表 213: No. 213  $O^7$   $P4_132$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & x + \frac{1}{4} & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & X + \frac{1}{4} & \frac{1}{4} - Z \end{pmatrix}$

*continued ...*

表 213

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & \frac{1}{4} - y & x + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{4} & \frac{1}{4} - Y & X + \frac{3}{4} \end{pmatrix}$
⑦ $\{2_{011} \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - x & z + \frac{3}{4} & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & Z + \frac{3}{4} & Y + \frac{1}{4} \end{pmatrix}$
⑧ $\{2_{1-10} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & \frac{3}{4} - x & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & \frac{3}{4} - X & \frac{3}{4} - Z \end{pmatrix}$
⑨ $\{2_{-101} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - z & \frac{3}{4} - y & \frac{3}{4} - x \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Z & \frac{3}{4} - Y & \frac{3}{4} - X \end{pmatrix}$
⑩ $\{2_{01-1} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - x & \frac{3}{4} - z & \frac{3}{4} - y \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & \frac{3}{4} - Z & \frac{3}{4} - Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 213

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & -x & y+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & -X & Y+\frac{1}{2} \end{pmatrix}$
⑬ $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z+\frac{1}{2} & \frac{1}{2}-x & -y \end{pmatrix}$	$\begin{pmatrix} Z+\frac{1}{2} & \frac{1}{2}-X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x+\frac{1}{2} & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} -Z & X+\frac{1}{2} & \frac{1}{2}-Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z+\frac{1}{2} & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} -Y & Z+\frac{1}{2} & \frac{1}{2}-X \end{pmatrix}$
⑰ $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & -z & x+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & -Z & X+\frac{1}{2} \end{pmatrix}$

continued ...

表 213

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - z & -x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - Z & -X \end{pmatrix}$
⑰ $\{4_{001}^+ \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & x + \frac{3}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & X + \frac{3}{4} & Z + \frac{1}{4} \end{pmatrix}$
⑳ $\{4_{100}^+ \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & \frac{1}{4} - z & y + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{4} & \frac{1}{4} - Z & Y + \frac{3}{4} \end{pmatrix}$
㉑ $\{4_{010}^+ \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{3}{4} & y + \frac{1}{4} & \frac{1}{4} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{3}{4} & Y + \frac{1}{4} & \frac{1}{4} - X \end{pmatrix}$
㉒ $\{4_{001}^- \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & \frac{1}{4} - x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & \frac{1}{4} - X & Z + \frac{3}{4} \end{pmatrix}$
㉓ $\{4_{100}^- \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & z + \frac{1}{4} & \frac{1}{4} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{3}{4} & Z + \frac{1}{4} & \frac{1}{4} - Y \end{pmatrix}$

continued ...

表 213

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4^-_{010} \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - z & y + \frac{3}{4} & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & Y + \frac{3}{4} & X + \frac{1}{4} \end{pmatrix}$

$$\begin{aligned} \text{表 214: No. } & 214 \quad O^8 \quad I4_132 \quad [ \text{cubic} ] \quad + \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, \\ & + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix} \end{aligned}$$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & x + \frac{1}{4} & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & X + \frac{1}{4} & \frac{1}{4} - Z \end{pmatrix}$

*continued ...*

表 214

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & \frac{1}{4} - y & x + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{4} & \frac{1}{4} - Y & X + \frac{3}{4} \end{pmatrix}$
⑦ $\{2_{011} \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - x & z + \frac{3}{4} & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & Z + \frac{3}{4} & Y + \frac{1}{4} \end{pmatrix}$
⑧ $\{2_{1-10} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & \frac{3}{4} - x & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & \frac{3}{4} - X & \frac{3}{4} - Z \end{pmatrix}$
⑨ $\{2_{-101} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - z & \frac{3}{4} - y & \frac{3}{4} - x \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Z & \frac{3}{4} - Y & \frac{3}{4} - X \end{pmatrix}$
⑩ $\{2_{01-1} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - x & \frac{3}{4} - z & \frac{3}{4} - y \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & \frac{3}{4} - Z & \frac{3}{4} - Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 214

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & -x & y+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & -X & Y+\frac{1}{2} \end{pmatrix}$
⑬ $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z+\frac{1}{2} & \frac{1}{2}-x & -y \end{pmatrix}$	$\begin{pmatrix} Z+\frac{1}{2} & \frac{1}{2}-X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x+\frac{1}{2} & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} -Z & X+\frac{1}{2} & \frac{1}{2}-Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z+\frac{1}{2} & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} -Y & Z+\frac{1}{2} & \frac{1}{2}-X \end{pmatrix}$
⑰ $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & -z & x+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & -Z & X+\frac{1}{2} \end{pmatrix}$

continued ...



表 214

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - z & -x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - Z & -X \end{pmatrix}$
⑰ $\{4_{001}^+ \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & x + \frac{3}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & X + \frac{3}{4} & Z + \frac{1}{4} \end{pmatrix}$
⑳ $\{4_{100}^+ \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & \frac{1}{4} - z & y + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{4} & \frac{1}{4} - Z & Y + \frac{3}{4} \end{pmatrix}$
㉑ $\{4_{010}^+ \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{3}{4} & y + \frac{1}{4} & \frac{1}{4} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{3}{4} & Y + \frac{1}{4} & \frac{1}{4} - X \end{pmatrix}$
㉒ $\{4_{001}^- \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & \frac{1}{4} - x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & \frac{1}{4} - X & Z + \frac{3}{4} \end{pmatrix}$
㉓ $\{4_{100}^- \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & z + \frac{1}{4} & \frac{1}{4} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{3}{4} & Z + \frac{1}{4} & \frac{1}{4} - Y \end{pmatrix}$

continued ...

表 214

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4^-_{010} \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - z & y + \frac{3}{4} & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & Y + \frac{3}{4} & X + \frac{1}{4} \end{pmatrix}$

表 215: No. 215  $T_d^1$   $P-43m$  [ cubic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 215

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 215

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑬ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑭ $\{m_{101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
⑮ $\{m_{011} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
⑯ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑰ $\{m_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$

continued ...

表 215

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{m_{01-1} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑲ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑳ $\{-4_{100}^+ 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
㉑ $\{-4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
㉒ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
㉓ $\{-4_{100}^- 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...

表 215

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$

表 216: No. 216  $T_d^2 F - 43m$  [ cubic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② {2 <sub>001</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ {2 <sub>100</sub>  0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ {2 <sub>010</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ {3 <sub>111</sub> <sup>+</sup>  0}	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*



表 216

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 216

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑬ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑭ $\{m_{101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
⑮ $\{m_{011} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
⑯ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑰ $\{m_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$

continued ...

表 216

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{m_{01-1} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑲ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑳ $\{-4_{100}^+ 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
㉑ $\{-4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
㉒ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
㉓ $\{-4_{100}^- 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...

表 216

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$

表 217: No. 217  $T_d^3$   $I - 43m$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② {2 <sub>001</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ {2 <sub>100</sub>  0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ {2 <sub>010</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ {3 <sub>111</sub> <sup>+</sup>  0}	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 217

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 217

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑬ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$
⑭ $\{m_{101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
⑮ $\{m_{011} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
⑯ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑰ $\{m_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$

continued ...

表 217

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{m_{01-1} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑲ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑳ $\{-4_{100}^+ 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
㉑ $\{-4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
㉒ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
㉓ $\{-4_{100}^- 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...



表 217

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$

表 218: No. 218  $T_d^4$   $P - 43n$  [ cubic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 218

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 218

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3^-_{-1-11} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑬ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑭ $\{m_{101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & y + \frac{1}{2} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - Y & X + \frac{1}{2} \end{pmatrix}$
⑮ $\{m_{011} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - z & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Z + \frac{1}{2} & Y + \frac{1}{2} \end{pmatrix}$
⑯ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑰ $\{m_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & y + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - Y & \frac{1}{2} - X \end{pmatrix}$

continued ...

表 218

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{m_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & z + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Z & \frac{1}{2} - Y \end{pmatrix}$
⑰ $\{-4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
⑳ $\{-4_{100}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & z + \frac{1}{2} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Z & Y + \frac{1}{2} \end{pmatrix}$
㉑ $\{-4_{010}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & \frac{1}{2} - y & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & Y + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
㉒ $\{-4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
㉓ $\{-4_{100}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - z & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & Z + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$

continued ...

表 218

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-4_{010}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{1}{2} - y & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & Y + \frac{1}{2} & X + \frac{1}{2} \end{pmatrix}$

$$\begin{aligned} \text{表 219: No. 219 } T_d^5 F - 43c \text{ [ cubic ] } &+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, \\ &+ \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}, + \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}, + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix} \end{aligned}$$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

*continued ...*

表 219

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑦ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑪ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...



表 219

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3^-_{-1-11} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑬ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑭ $\{m_{101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & y + \frac{1}{2} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - Y & X + \frac{1}{2} \end{pmatrix}$
⑮ $\{m_{011} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - z & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Z + \frac{1}{2} & Y + \frac{1}{2} \end{pmatrix}$
⑯ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑰ $\{m_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & y + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - Y & \frac{1}{2} - X \end{pmatrix}$

continued ...

表 219

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{m_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & z + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Z & \frac{1}{2} - Y \end{pmatrix}$
⑲ $\{-4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
⑳ $\{-4_{100}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & z + \frac{1}{2} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Z & Y + \frac{1}{2} \end{pmatrix}$
㉑ $\{-4_{010}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & \frac{1}{2} - y & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & Y + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
㉒ $\{-4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
㉓ $\{-4_{100}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - z & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & Z + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$

continued ...

表 219

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{-4_{010}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{1}{2} - y & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & Y + \frac{1}{2} & X + \frac{1}{2} \end{pmatrix}$

$$\begin{aligned} \text{表 220: No. } & 220 \quad T_d^6 \quad I - 43d \quad [ \text{cubic} ] \quad + \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}, \\ & + \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix} \end{aligned}$$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 220

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & -x & y+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & -X & Y+\frac{1}{2} \end{pmatrix}$
⑦ $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z+\frac{1}{2} & \frac{1}{2}-x & -y \end{pmatrix}$	$\begin{pmatrix} Z+\frac{1}{2} & \frac{1}{2}-X & -Y \end{pmatrix}$
⑧ $\{3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x+\frac{1}{2} & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} -Z & X+\frac{1}{2} & \frac{1}{2}-Y \end{pmatrix}$
⑨ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑩ $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z+\frac{1}{2} & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} -Y & Z+\frac{1}{2} & \frac{1}{2}-X \end{pmatrix}$
⑪ $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & -z & x+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & -Z & X+\frac{1}{2} \end{pmatrix}$

continued ...

表 220

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{-1-11}^{\frac{1}{2}\frac{1}{2}0}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - z & -x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - Z & -X \end{pmatrix}$
⑬ $\{m_{110} \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & \frac{3}{4} - x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & X + \frac{3}{4} & \frac{3}{4} - Z \end{pmatrix}$
⑭ $\{m_{101} \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - z & y + \frac{3}{4} & \frac{1}{4} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{3}{4} & \frac{3}{4} - Y & X + \frac{1}{4} \end{pmatrix}$
⑮ $\{m_{011} \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & \frac{1}{4} - z & \frac{3}{4} - y \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & Z + \frac{1}{4} & Y + \frac{3}{4} \end{pmatrix}$
⑯ $\{m_{1-10} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & x + \frac{1}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & \frac{1}{4} - X & \frac{1}{4} - Z \end{pmatrix}$
⑰ $\{m_{-101} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & y + \frac{1}{4} & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & \frac{1}{4} - Y & \frac{1}{4} - X \end{pmatrix}$

continued ...

表 220

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{m_{01-1} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & z + \frac{1}{4} & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & \frac{1}{4} - Z & \frac{1}{4} - Y \end{pmatrix}$
⑰ $\{-4_{001}^+ \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & \frac{1}{4} - x & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & X + \frac{1}{4} & Z + \frac{3}{4} \end{pmatrix}$
⑳ $\{-4_{100}^+ \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - x & z + \frac{3}{4} & \frac{1}{4} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{3}{4} & \frac{3}{4} - Z & Y + \frac{1}{4} \end{pmatrix}$
㉑ $\{-4_{010}^+ \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - z & \frac{3}{4} - y & x + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{4} & Y + \frac{3}{4} & \frac{3}{4} - X \end{pmatrix}$
㉒ $\{-4_{001}^- \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & x + \frac{3}{4} & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & \frac{3}{4} - X & Z + \frac{1}{4} \end{pmatrix}$
㉓ $\{-4_{100}^- \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - x & \frac{3}{4} - z & y + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{4} & Z + \frac{3}{4} & \frac{3}{4} - Y \end{pmatrix}$

continued ...

表 220

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②4 $\{-4^-_{010} \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\left(z + \frac{3}{4} \quad \frac{1}{4} - y \quad \frac{3}{4} - x\right)$	$\left(\frac{3}{4} - Z \quad Y + \frac{1}{4} \quad X + \frac{3}{4}\right)$



表 221: No. 221  $O_h^1$   $Pm-3m$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 221

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
⑦ $\{2_{011} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{2_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
⑩ $\{2_{01-1} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 221

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑰ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 221

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑰ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑳ $\{4_{100}^+ 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
㉑ $\{4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
㉒ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
㉓ $\{4_{100}^- 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...

表 221

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$
②⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
②⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
②⑦ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
②⑧ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
②⑨ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

continued ...

表 221

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑩ $\{\mathbf{m}_{101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
③⑪ $\{\mathbf{m}_{011} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
③⑫ $\{\mathbf{m}_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
③⑬ $\{\mathbf{m}_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
③⑭ $\{\mathbf{m}_{01-1} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
③⑮ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 221

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑥ $\{-3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
③⑦ $\{-3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
③⑧ $\{-3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
③⑨ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
④⑩ $\{-3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
④⑪ $\{-3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 221

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④② $\{-3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
④③ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④④ $\{-4_{100}^+ 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
④⑤ $\{-4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
④⑥ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
④⑦ $\{-4_{100}^- 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...



表 221

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④⑧ $\{-4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$

表 222: No. 222  $O_h^2$   $Pn-3n$  [ cubic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
③ $\{2_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 222

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & \frac{1}{2}-y & x \end{pmatrix}$	$\begin{pmatrix} Z & \frac{1}{2}-Y & X \end{pmatrix}$
⑦ $\{2_{011} \frac{1}{2}00\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & z & y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & Z & Y \end{pmatrix}$
⑧ $\{2_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-x & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-X & \frac{1}{2}-Z \end{pmatrix}$
⑨ $\{2_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & \frac{1}{2}-y & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & \frac{1}{2}-Y & \frac{1}{2}-X \end{pmatrix}$
⑩ $\{2_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & \frac{1}{2}-z & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Z & \frac{1}{2}-Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 222

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & \frac{1}{2}-x & y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & \frac{1}{2}-X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z & \frac{1}{2}-x & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} Z & \frac{1}{2}-X & \frac{1}{2}-Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & x & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & X & \frac{1}{2}-Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & z & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & Z & \frac{1}{2}-X \end{pmatrix}$
⑰ $\{3_{-11-1}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-z & x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-Z & X \end{pmatrix}$

continued ...

表 222

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - z & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - Z & \frac{1}{2} - X \end{pmatrix}$
⑯ $\{4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z \end{pmatrix}$
⑰ $\{4_{100}^+ 0\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - z & y \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Z & Y \end{pmatrix}$
⑱ $\{4_{010}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z & y & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Z & Y & \frac{1}{2} - X \end{pmatrix}$
⑲ $\{4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z \end{pmatrix}$
⑳ $\{4_{100}^- 00\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & z & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} X & Z & \frac{1}{2} - Y \end{pmatrix}$

continued ...

表 222

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4_{010}^- \frac{1}{2}00\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & y & x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & Y & X \end{pmatrix}$
②⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
②⑥ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
②⑦ $\{m_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
②⑧ $\{m_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
②⑨ $\{m_{110} 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & X & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 222

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑩ $\{m_{101} 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y + \frac{1}{2} & -x \end{pmatrix}$	$\begin{pmatrix} Z & \frac{1}{2} - Y & X \end{pmatrix}$
③⑪ $\{m_{011} \frac{1}{2}00\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -z & -y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Z & Y \end{pmatrix}$
③⑫ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
③⑬ $\{m_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & y + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - Y & \frac{1}{2} - X \end{pmatrix}$
③⑭ $\{m_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & z + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Z & \frac{1}{2} - Y \end{pmatrix}$
③⑮ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 222

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑥ $\{-3_{1-1-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & x + \frac{1}{2} & -y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - X & Y \end{pmatrix}$
③⑦ $\{-3_{-11-1}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z & \frac{1}{2} - X & \frac{1}{2} - Y \end{pmatrix}$
③⑧ $\{-3_{-1-11}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & -x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & X & \frac{1}{2} - Y \end{pmatrix}$
③⑨ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
④⑩ $\{-3_{1-1-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & Z & \frac{1}{2} - X \end{pmatrix}$
④⑪ $\{-3_{-11-1}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & z + \frac{1}{2} & -x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - Z & X \end{pmatrix}$

continued ...



表 222

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④② $\{-3_{-1-11}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - Z & \frac{1}{2} - X \end{pmatrix}$
④③ $\{-4_{001}^+ \frac{1}{2}00\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X & Z \end{pmatrix}$
④④ $\{-4_{100}^+ 0\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z + \frac{1}{2} & -y \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Z & Y \end{pmatrix}$
④⑤ $\{-4_{010}^+ 00\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & -y & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z & Y & \frac{1}{2} - X \end{pmatrix}$
④⑥ $\{-4_{001}^- 0\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - X & Z \end{pmatrix}$
④⑦ $\{-4_{100}^- 00\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & -z & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & Z & \frac{1}{2} - Y \end{pmatrix}$

continued ...

表 222

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④⑧ $\{-4_{010}^-\frac{1}{2}00\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & -y & -x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & Y & X \end{pmatrix}$

表 223: No. 223  $O_h^3$   $Pm-3n$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ $\{2_{100} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 223

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{1}{2} - y & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - Y & X + \frac{1}{2} \end{pmatrix}$
⑦ $\{2_{011} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & z + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Z + \frac{1}{2} & Y + \frac{1}{2} \end{pmatrix}$
⑧ $\{2_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑨ $\{2_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & \frac{1}{2} - y & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - Y & \frac{1}{2} - X \end{pmatrix}$
⑩ $\{2_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - z & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Z & \frac{1}{2} - Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 223

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑰ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 223

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑲ $\{4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
⑳ $\{4_{100}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - z & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Z & Y + \frac{1}{2} \end{pmatrix}$
㉑ $\{4_{010}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & y + \frac{1}{2} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & Y + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
㉒ $\{4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
㉓ $\{4_{100}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & z + \frac{1}{2} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & Z + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$

continued ...

表 223

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4^-_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & y + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & Y + \frac{1}{2} & X + \frac{1}{2} \end{pmatrix}$
②⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
②⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
②⑦ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
②⑧ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
②⑨ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 223

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑩ $\{m_{101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & y + \frac{1}{2} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - Y & X + \frac{1}{2} \end{pmatrix}$
③⑪ $\{m_{011} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - z & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Z + \frac{1}{2} & Y + \frac{1}{2} \end{pmatrix}$
③⑫ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
③⑬ $\{m_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & y + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - Y & \frac{1}{2} - X \end{pmatrix}$
③⑭ $\{m_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & z + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Z & \frac{1}{2} - Y \end{pmatrix}$
③⑮ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...



表 223

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑥ $\{-3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
③⑦ $\{-3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
③⑧ $\{-3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
③⑨ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
④⑩ $\{-3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
④⑪ $\{-3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 223

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④② $\{-3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
④③ $\{-4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
④④ $\{-4_{100}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & z + \frac{1}{2} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Z & Y + \frac{1}{2} \end{pmatrix}$
④⑤ $\{-4_{010}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & \frac{1}{2} - y & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & Y + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
④⑥ $\{-4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
④⑦ $\{-4_{100}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - z & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & Z + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$

continued ...

表 223

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
$\textcircled{48} \quad \{-4_{010}^-   \frac{1}{2} \frac{1}{2} \frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\left( z + \frac{1}{2} \quad \frac{1}{2} - y \quad \frac{1}{2} - x \right)$	$\left( \frac{1}{2} - Z \quad Y + \frac{1}{2} \quad X + \frac{1}{2} \right)$

表 224: No. 224  $O_h^4$   $Pn-3m$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & \frac{1}{2}-y & z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Y & Z \end{pmatrix}$
③ $\{2_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2}-y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2}-Y & \frac{1}{2}-Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-x & y & \frac{1}{2}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & Y & \frac{1}{2}-Z \end{pmatrix}$
⑤ $\{2_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y+\frac{1}{2} & x+\frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{2} & X+\frac{1}{2} & -Z \end{pmatrix}$

*continued ...*

表 224

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & -y & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & -Y & X + \frac{1}{2} \end{pmatrix}$
⑦ $\{2_{011} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & z + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Z + \frac{1}{2} & Y + \frac{1}{2} \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{2_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
⑩ $\{2_{01-1} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 224

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & \frac{1}{2}-x & y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & \frac{1}{2}-X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z & \frac{1}{2}-x & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} Z & \frac{1}{2}-X & \frac{1}{2}-Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & x & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & X & \frac{1}{2}-Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & z & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & Z & \frac{1}{2}-X \end{pmatrix}$
⑰ $\{3_{-11-1}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & \frac{1}{2}-z & x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-Z & X \end{pmatrix}$

continued ...

表 224

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - z & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - Z & \frac{1}{2} - X \end{pmatrix}$
⑯ $\{4_{001}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
⑰ $\{4_{100}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -z & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Z & Y + \frac{1}{2} \end{pmatrix}$
⑱ $\{4_{010}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & y + \frac{1}{2} & -x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & Y + \frac{1}{2} & -X \end{pmatrix}$
㉑ $\{4_{001}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & -X & Z + \frac{1}{2} \end{pmatrix}$
㉒ $\{4_{100}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & z + \frac{1}{2} & -y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & Z + \frac{1}{2} & -Y \end{pmatrix}$

continued ...

表 224

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4_{010}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & y + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Z & Y + \frac{1}{2} & X + \frac{1}{2} \end{pmatrix}$
②⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
②⑥ $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y + \frac{1}{2} & -z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Y & Z \end{pmatrix}$
②⑦ $\{m_{100} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X & \frac{1}{2} - Y & \frac{1}{2} - Z \end{pmatrix}$
②⑧ $\{m_{010} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Y & \frac{1}{2} - Z \end{pmatrix}$
②⑨ $\{m_{110} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & -Z \end{pmatrix}$

continued ...



表 224

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑩ $\{m_{101} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & y & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} Z+\frac{1}{2} & -Y & X+\frac{1}{2} \end{pmatrix}$
③⑪ $\{m_{011} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2}-z & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} -X & Z+\frac{1}{2} & Y+\frac{1}{2} \end{pmatrix}$
③⑫ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
③⑬ $\{m_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
③⑭ $\{m_{01-1} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
③⑮ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 224

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑥ $\{-3_{1-1-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & x + \frac{1}{2} & -y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - X & Y \end{pmatrix}$
③⑦ $\{-3_{-11-1}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z & \frac{1}{2} - X & \frac{1}{2} - Y \end{pmatrix}$
③⑧ $\{-3_{-1-11}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & -x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & X & \frac{1}{2} - Y \end{pmatrix}$
③⑨ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
④⑩ $\{-3_{1-1-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & -z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & Z & \frac{1}{2} - X \end{pmatrix}$
④⑪ $\{-3_{-11-1}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & z + \frac{1}{2} & -x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - Z & X \end{pmatrix}$

continued ...

表 224

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④② $\{-3_{-1-11}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y & \frac{1}{2} - Z & \frac{1}{2} - X \end{pmatrix}$
④③ $\{-4_{001}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
④④ $\{-4_{100}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & z & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & -Z & Y + \frac{1}{2} \end{pmatrix}$
④⑤ $\{-4_{010}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & \frac{1}{2} - y & x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & Y + \frac{1}{2} & -X \end{pmatrix}$
④⑥ $\{-4_{001}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & -X & Z + \frac{1}{2} \end{pmatrix}$
④⑦ $\{-4_{100}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - z & y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & Z + \frac{1}{2} & -Y \end{pmatrix}$

continued ...

表 224

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④⑧ $\{-4^-_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z & \frac{1}{2}-y & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} -Z & Y+\frac{1}{2} & X+\frac{1}{2} \end{pmatrix}$

表 225: No. 225  $O_h^5 Fm - 3m$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② {2 <sub>001</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ {2 <sub>100</sub>  0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ {2 <sub>010</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ {2 <sub>110</sub>  0}	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

*continued ...*

表 225

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
⑦ $\{2_{011} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{2_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
⑩ $\{2_{01-1} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 225

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑰ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 225

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑰ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑳ $\{4_{100}^+ 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
㉑ $\{4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
㉒ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
㉓ $\{4_{100}^- 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...



表 225

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$
②⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
②⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
②⑦ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
②⑧ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
②⑨ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

continued ...

表 225

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑩ $\{\mathbf{m}_{101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
③⑪ $\{\mathbf{m}_{011} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
③⑫ $\{\mathbf{m}_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
③⑬ $\{\mathbf{m}_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
③⑭ $\{\mathbf{m}_{01-1} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
③⑮ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 225

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑥ $\{-3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
③⑦ $\{-3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
③⑧ $\{-3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
③⑨ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
④⑩ $\{-3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
④⑪ $\{-3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 225

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④② $\{-3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
④③ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④④ $\{-4_{100}^+ 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
④⑤ $\{-4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
④⑥ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
④⑦ $\{-4_{100}^- 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...

表 225

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
$\textcircled{48} \quad \{-4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$

表 226: No. 226  $O_h^6 Fm - 3c$  [ cubic ]  $+ \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+ \begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+ \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② {2 <sub>001</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ {2 <sub>100</sub>  0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ {2 <sub>010</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ {2 <sub>110</sub>  \frac{1}{2}\frac{1}{2}\frac{1}{2}}	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

*continued ...*

表 226

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{1}{2} - y & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - Y & X + \frac{1}{2} \end{pmatrix}$
⑦ $\{2_{011} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & z + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Z + \frac{1}{2} & Y + \frac{1}{2} \end{pmatrix}$
⑧ $\{2_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑨ $\{2_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & \frac{1}{2} - y & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - Y & \frac{1}{2} - X \end{pmatrix}$
⑩ $\{2_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - z & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Z & \frac{1}{2} - Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 226

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑰ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...



表 226

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑲ $\{4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
⑳ $\{4_{100}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - z & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Z & Y + \frac{1}{2} \end{pmatrix}$
㉑ $\{4_{010}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & y + \frac{1}{2} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & Y + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
㉒ $\{4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
㉓ $\{4_{100}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & z + \frac{1}{2} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & Z + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$

continued ...

表 226

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4^-_{010} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & y + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & Y + \frac{1}{2} & X + \frac{1}{2} \end{pmatrix}$
②⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
②⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
②⑦ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
②⑧ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
②⑨ $\{m_{110} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & X + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 226

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑩ $\{m_{101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & y + \frac{1}{2} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - Y & X + \frac{1}{2} \end{pmatrix}$
③⑪ $\{m_{011} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - z & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Z + \frac{1}{2} & Y + \frac{1}{2} \end{pmatrix}$
③⑫ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & x + \frac{1}{2} & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
③⑬ $\{m_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & y + \frac{1}{2} & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - Y & \frac{1}{2} - X \end{pmatrix}$
③⑭ $\{m_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & z + \frac{1}{2} & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Z & \frac{1}{2} - Y \end{pmatrix}$
③⑮ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 226

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑥ $\{-3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
③⑦ $\{-3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
③⑧ $\{-3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
③⑨ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
④⑩ $\{-3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
④⑪ $\{-3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 226

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④② $\{-3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
④③ $\{-4_{001}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{1}{2} & Z + \frac{1}{2} \end{pmatrix}$
④④ $\{-4_{100}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & z + \frac{1}{2} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Z & Y + \frac{1}{2} \end{pmatrix}$
④⑤ $\{-4_{010}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & \frac{1}{2} - y & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & Y + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
④⑥ $\{-4_{001}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - X & Z + \frac{1}{2} \end{pmatrix}$
④⑦ $\{-4_{100}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - z & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & Z + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$

continued ...

表 226

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④⑧ $\{-4_{010}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{1}{2} - y & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & Y + \frac{1}{2} & X + \frac{1}{2} \end{pmatrix}$

表 227: No. 227  $O_h^7 Fd - 3m$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{3}{4}\frac{1}{4}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - x & \frac{1}{4} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & \frac{1}{4} - Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{3}{4} - y & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{3}{4} - Y & \frac{1}{4} - Z \end{pmatrix}$
④ $\{2_{010} \frac{1}{4}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - x & y + \frac{1}{2} & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & Y + \frac{1}{2} & \frac{3}{4} - Z \end{pmatrix}$
⑤ $\{2_{110} \frac{3}{4}\frac{1}{4}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & x + \frac{1}{4} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & X + \frac{1}{4} & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 227

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{1}{4}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & \frac{1}{2} - y & x + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{4} & \frac{1}{2} - Y & X + \frac{3}{4} \end{pmatrix}$
⑦ $\{2_{011} \frac{1}{2}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & z + \frac{3}{4} & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Z + \frac{3}{4} & Y + \frac{1}{4} \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{2_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
⑩ $\{2_{01-1} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...



表 227

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+   \frac{3}{4} \frac{1}{4} \frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - z & \frac{1}{4} - x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Z & \frac{1}{4} - X & Y + \frac{1}{2} \end{pmatrix}$
⑬ $\{3_{-11-1}^+   \frac{1}{2} \frac{3}{4} \frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{3}{4} - x & \frac{1}{4} - y \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{3}{4} - X & \frac{1}{4} - Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+   \frac{1}{4} \frac{1}{2} \frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - z & x + \frac{1}{2} & \frac{3}{4} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & X + \frac{1}{2} & \frac{3}{4} - Y \end{pmatrix}$
⑮ $\{3_{111}^-   0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^-   \frac{1}{4} \frac{1}{2} \frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & z + \frac{1}{2} & \frac{3}{4} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & Z + \frac{1}{2} & \frac{3}{4} - X \end{pmatrix}$
⑰ $\{3_{-11-1}^-   \frac{3}{4} \frac{1}{4} \frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & \frac{1}{4} - z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & \frac{1}{4} - Z & X + \frac{1}{2} \end{pmatrix}$

continued ...

表 227

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- \frac{1}{2}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{3}{4} - z & \frac{1}{4} - x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{3}{4} - Z & \frac{1}{4} - X \end{pmatrix}$
⑯ $\{4_{001}^+ \frac{1}{2}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & x + \frac{3}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & X + \frac{3}{4} & Z + \frac{1}{4} \end{pmatrix}$
⑰ $\{4_{100}^+ \frac{1}{4}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & \frac{1}{2} - z & y + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{4} & \frac{1}{2} - Z & Y + \frac{3}{4} \end{pmatrix}$
⑱ $\{4_{010}^+ \frac{3}{4}\frac{1}{4}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{3}{4} & y + \frac{1}{4} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{3}{4} & Y + \frac{1}{4} & \frac{1}{2} - X \end{pmatrix}$
㉑ $\{4_{001}^- \frac{1}{4}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & \frac{1}{2} - x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & \frac{1}{2} - X & Z + \frac{3}{4} \end{pmatrix}$
㉒ $\{4_{100}^- \frac{3}{4}\frac{1}{4}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & z + \frac{1}{4} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{3}{4} & Z + \frac{1}{4} & \frac{1}{2} - Y \end{pmatrix}$

continued ...

表 227

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4_{010}^- \frac{1}{2}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & y + \frac{3}{4} & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & Y + \frac{3}{4} & X + \frac{1}{4} \end{pmatrix}$
②⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
②⑥ $\{m_{001} \frac{1}{4}\frac{3}{4}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & y + \frac{3}{4} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & \frac{3}{4} - Y & Z + \frac{1}{2} \end{pmatrix}$
②⑦ $\{m_{100} \frac{1}{2}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{4} & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{4} - Y & \frac{3}{4} - Z \end{pmatrix}$
②⑧ $\{m_{010} \frac{3}{4}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & \frac{1}{2} - y & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & Y + \frac{1}{2} & \frac{1}{4} - Z \end{pmatrix}$
②⑨ $\{m_{110} \frac{1}{4}\frac{3}{4}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & \frac{3}{4} - x & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & X + \frac{3}{4} & \frac{1}{2} - Z \end{pmatrix}$

continued ...

表 227

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑩ $\{m_{101} \frac{3}{4}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - z & y + \frac{1}{2} & \frac{1}{4} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{3}{4} & \frac{1}{2} - Y & X + \frac{1}{4} \end{pmatrix}$
③⑪ $\{m_{011} \frac{1}{2}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{4} - z & \frac{3}{4} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & Z + \frac{1}{4} & Y + \frac{3}{4} \end{pmatrix}$
③⑫ $\{m_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
③⑬ $\{m_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
③⑭ $\{m_{01-1} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
③⑮ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 227

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑥ $\{-3_{-1-1}^+ \frac{1}{4}\frac{3}{4}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & x + \frac{3}{4} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & \frac{3}{4} - X & Y + \frac{1}{2} \end{pmatrix}$
③⑦ $\{-3_{-11-1}^+ \frac{1}{2}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & x + \frac{1}{4} & y + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{4} - X & \frac{3}{4} - Y \end{pmatrix}$
③⑧ $\{-3_{-1-11}^+ \frac{3}{4}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{3}{4} & \frac{1}{2} - x & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Z & X + \frac{1}{2} & \frac{1}{4} - Y \end{pmatrix}$
③⑨ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
④⑩ $\{-3_{-1-1-1}^- \frac{3}{4}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & \frac{1}{2} - z & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & Z + \frac{1}{2} & \frac{1}{4} - X \end{pmatrix}$
④⑪ $\{-3_{-11-1}^- \frac{1}{4}\frac{3}{4}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & z + \frac{3}{4} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & \frac{3}{4} - Z & X + \frac{1}{2} \end{pmatrix}$

continued ...

表 227

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④② $\{-3_{-1-11}^- \frac{1}{2}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & z+\frac{1}{4} & x+\frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{2} & \frac{1}{4}-Z & \frac{3}{4}-X \end{pmatrix}$
④③ $\{-4_{001}^+ \frac{1}{2}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y+\frac{1}{2} & \frac{1}{4}-x & \frac{3}{4}-z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & X+\frac{1}{4} & Z+\frac{3}{4} \end{pmatrix}$
④④ $\{-4_{100}^+ \frac{3}{4}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-x & z+\frac{1}{2} & \frac{1}{4}-y \end{pmatrix}$	$\begin{pmatrix} X+\frac{3}{4} & \frac{1}{2}-Z & Y+\frac{1}{4} \end{pmatrix}$
④⑤ $\{-4_{010}^+ \frac{1}{4}\frac{3}{4}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-z & \frac{3}{4}-y & x+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} Z+\frac{1}{4} & Y+\frac{3}{4} & \frac{1}{2}-X \end{pmatrix}$
④⑥ $\{-4_{001}^- \frac{3}{4}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-y & x+\frac{1}{2} & \frac{1}{4}-z \end{pmatrix}$	$\begin{pmatrix} Y+\frac{3}{4} & \frac{1}{2}-X & Z+\frac{1}{4} \end{pmatrix}$
④⑦ $\{-4_{100}^- \frac{1}{4}\frac{3}{4}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-x & \frac{3}{4}-z & y+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{4} & Z+\frac{3}{4} & \frac{1}{2}-Y \end{pmatrix}$

continued ...

表 227

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
$\textcircled{48} \quad \{-4^-_{010} \frac{1}{2}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\left(z + \frac{1}{2} \quad \frac{1}{4} - y \quad \frac{3}{4} - x\right)$	$\left(\frac{1}{2} - Z \quad Y + \frac{1}{4} \quad X + \frac{3}{4}\right)$

表 228: No. 228  $O_h^8 Fd - 3c$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} 0 & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ ,  $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{4}\frac{3}{4}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - x & \frac{3}{4} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & \frac{3}{4} - Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{4} - y & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{4} - Y & \frac{3}{4} - Z \end{pmatrix}$
④ $\{2_{010} \frac{3}{4}\frac{1}{2}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - x & y + \frac{1}{2} & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & Y + \frac{1}{2} & \frac{1}{4} - Z \end{pmatrix}$
⑤ $\{2_{110} \frac{3}{4}\frac{1}{4}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & x + \frac{1}{4} & -z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & X + \frac{1}{4} & -Z \end{pmatrix}$

continued ...



表 228

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{1}{4}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & -y & x + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{4} & -Y & X + \frac{3}{4} \end{pmatrix}$
⑦ $\{2_{011} 0\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -x & z + \frac{3}{4} & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -X & Z + \frac{3}{4} & Y + \frac{1}{4} \end{pmatrix}$
⑧ $\{2_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - y & \frac{1}{2} - x & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & \frac{1}{2} - X & \frac{1}{2} - Z \end{pmatrix}$
⑨ $\{2_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & \frac{1}{2} - y & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & \frac{1}{2} - Y & \frac{1}{2} - X \end{pmatrix}$
⑩ $\{2_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & \frac{1}{2} - z & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & \frac{1}{2} - Z & \frac{1}{2} - Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 228

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+   \frac{1}{4} \frac{3}{4} \frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - z & \frac{3}{4} - x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & \frac{3}{4} - X & Y + \frac{1}{2} \end{pmatrix}$
⑬ $\{3_{-11-1}^+   \frac{1}{2} \frac{1}{4} \frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & \frac{1}{4} - x & \frac{3}{4} - y \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{4} - X & \frac{3}{4} - Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+   \frac{3}{4} \frac{1}{2} \frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - z & x + \frac{1}{2} & \frac{1}{4} - y \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Z & X + \frac{1}{2} & \frac{1}{4} - Y \end{pmatrix}$
⑮ $\{3_{111}^-   0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^-   \frac{3}{4} \frac{1}{2} \frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & z + \frac{1}{2} & \frac{1}{4} - x \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & Z + \frac{1}{2} & \frac{1}{4} - X \end{pmatrix}$
⑰ $\{3_{-11-1}^-   \frac{1}{4} \frac{3}{4} \frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & \frac{3}{4} - z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & \frac{3}{4} - Z & X + \frac{1}{2} \end{pmatrix}$

continued ...

表 228

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- \frac{1}{2}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{4} - z & \frac{3}{4} - x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{4} - Z & \frac{3}{4} - X \end{pmatrix}$
⑯ $\{4_{001}^+ 0\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -y & x + \frac{3}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -Y & X + \frac{3}{4} & Z + \frac{1}{4} \end{pmatrix}$
⑰ $\{4_{100}^+ \frac{1}{4}0\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & -z & y + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{4} & -Z & Y + \frac{3}{4} \end{pmatrix}$
⑱ $\{4_{010}^+ \frac{3}{4}\frac{1}{4}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z + \frac{3}{4} & y + \frac{1}{4} & -x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{3}{4} & Y + \frac{1}{4} & -X \end{pmatrix}$
㉑ $\{4_{001}^- \frac{1}{4}0\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & -x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & -X & Z + \frac{3}{4} \end{pmatrix}$
㉒ $\{4_{100}^- \frac{3}{4}\frac{1}{4}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & z + \frac{1}{4} & -y \end{pmatrix}$	$\begin{pmatrix} X + \frac{3}{4} & Z + \frac{1}{4} & -Y \end{pmatrix}$

continued ...

表 228

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4_{010}^- 0\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -z & y + \frac{3}{4} & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -Z & Y + \frac{3}{4} & X + \frac{1}{4} \end{pmatrix}$
②⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
②⑥ $\{m_{001} \frac{3}{4}\frac{1}{4}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & y + \frac{1}{4} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & \frac{1}{4} - Y & Z + \frac{1}{2} \end{pmatrix}$
②⑦ $\{m_{100} \frac{1}{2}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{3}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{3}{4} - Y & \frac{1}{4} - Z \end{pmatrix}$
②⑧ $\{m_{010} \frac{1}{4}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & \frac{1}{2} - y & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & Y + \frac{1}{2} & \frac{3}{4} - Z \end{pmatrix}$
②⑨ $\{m_{110} \frac{1}{4}\frac{3}{4}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & \frac{3}{4} - x & z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & X + \frac{3}{4} & -Z \end{pmatrix}$

continued ...

表 228

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑩ $\{m_{101} \frac{3}{4}0\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-z & y & \frac{1}{4}-x \end{pmatrix}$	$\begin{pmatrix} Z+\frac{3}{4} & -Y & X+\frac{1}{4} \end{pmatrix}$
③⑪ $\{m_{011} 0\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{4}-z & \frac{3}{4}-y \end{pmatrix}$	$\begin{pmatrix} -X & Z+\frac{1}{4} & Y+\frac{3}{4} \end{pmatrix}$
③⑫ $\{m_{1-10} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y+\frac{1}{2} & x+\frac{1}{2} & z+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & \frac{1}{2}-X & \frac{1}{2}-Z \end{pmatrix}$
③⑬ $\{m_{-101} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z+\frac{1}{2} & y+\frac{1}{2} & x+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & \frac{1}{2}-Y & \frac{1}{2}-X \end{pmatrix}$
③⑭ $\{m_{01-1} \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x+\frac{1}{2} & z+\frac{1}{2} & y+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-X & \frac{1}{2}-Z & \frac{1}{2}-Y \end{pmatrix}$
③⑮ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 228

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑥ $\{-3_{1-1-1}^+ \frac{3}{4}\frac{1}{4}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{3}{4} & x + \frac{1}{4} & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Z & \frac{1}{4} - X & Y + \frac{1}{2} \end{pmatrix}$
③⑦ $\{-3_{-11-1}^+ \frac{1}{2}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & x + \frac{3}{4} & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{3}{4} - X & \frac{1}{4} - Y \end{pmatrix}$
③⑧ $\{-3_{-1-11}^+ \frac{1}{4}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & \frac{1}{2} - x & y + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & X + \frac{1}{2} & \frac{3}{4} - Y \end{pmatrix}$
③⑨ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
④⑩ $\{-3_{1-1-1}^- \frac{1}{4}\frac{1}{2}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & \frac{1}{2} - z & x + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & Z + \frac{1}{2} & \frac{3}{4} - X \end{pmatrix}$
④⑪ $\{-3_{-11-1}^- \frac{3}{4}\frac{1}{4}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & z + \frac{1}{4} & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & \frac{1}{4} - Z & X + \frac{1}{2} \end{pmatrix}$

continued ...

表 228

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④② $\{-3_{-1-11}^- \frac{1}{2}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & z+\frac{3}{4} & x+\frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{2} & \frac{3}{4}-Z & \frac{1}{4}-X \end{pmatrix}$
④③ $\{-4_{001}^+ 0\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{4}-x & \frac{3}{4}-z \end{pmatrix}$	$\begin{pmatrix} -Y & X+\frac{1}{4} & Z+\frac{3}{4} \end{pmatrix}$
④④ $\{-4_{100}^+ \frac{3}{4}0\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-x & z & \frac{1}{4}-y \end{pmatrix}$	$\begin{pmatrix} X+\frac{3}{4} & -Z & Y+\frac{1}{4} \end{pmatrix}$
④⑤ $\{-4_{010}^+ \frac{1}{4}\frac{3}{4}0\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-z & \frac{3}{4}-y & x \end{pmatrix}$	$\begin{pmatrix} Z+\frac{1}{4} & Y+\frac{3}{4} & -X \end{pmatrix}$
④⑥ $\{-4_{001}^- \frac{3}{4}0\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-y & x & \frac{1}{4}-z \end{pmatrix}$	$\begin{pmatrix} Y+\frac{3}{4} & -X & Z+\frac{1}{4} \end{pmatrix}$
④⑦ $\{-4_{100}^- \frac{1}{4}\frac{3}{4}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-x & \frac{3}{4}-z & y \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{4} & Z+\frac{3}{4} & -Y \end{pmatrix}$

continued ...

表 228

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
$\textcircled{48} \quad \{-4_{010}^-   0_{\frac{1}{4}\frac{3}{4}}\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z & \frac{1}{4} - y & \frac{3}{4} - x \end{pmatrix}$	$\begin{pmatrix} -Z & Y + \frac{1}{4} & X + \frac{3}{4} \end{pmatrix}$



表 229: No. 229  $O_h^9$   $Im - 3m$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① {1 0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② {2 <sub>001</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
③ {2 <sub>100</sub>  0}	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
④ {2 <sub>010</sub>  0}	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
⑤ {2 <sub>110</sub>  0}	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

continued ...

表 229

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
⑦ $\{2_{011} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
⑧ $\{2_{1-10} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
⑨ $\{2_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
⑩ $\{2_{01-1} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 229

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
⑬ $\{3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
⑰ $\{3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 229

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
⑰ $\{4_{001}^+ 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
⑳ $\{4_{100}^+ 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
㉑ $\{4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
㉒ $\{4_{001}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
㉓ $\{4_{100}^- 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...

表 229

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$
②⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
②⑥ $\{m_{001} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & -z \end{pmatrix}$	$\begin{pmatrix} -X & -Y & Z \end{pmatrix}$
②⑦ $\{m_{100} 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & y & z \end{pmatrix}$	$\begin{pmatrix} X & -Y & -Z \end{pmatrix}$
②⑧ $\{m_{010} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -y & z \end{pmatrix}$	$\begin{pmatrix} -X & Y & -Z \end{pmatrix}$
②⑨ $\{m_{110} 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -x & z \end{pmatrix}$	$\begin{pmatrix} Y & X & -Z \end{pmatrix}$

continued ...

表 229

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑩ $\{\mathbf{m}_{101} 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & y & -x \end{pmatrix}$	$\begin{pmatrix} Z & -Y & X \end{pmatrix}$
③⑪ $\{\mathbf{m}_{011} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & -z & -y \end{pmatrix}$	$\begin{pmatrix} -X & Z & Y \end{pmatrix}$
③⑫ $\{\mathbf{m}_{1-10} 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & x & z \end{pmatrix}$	$\begin{pmatrix} -Y & -X & -Z \end{pmatrix}$
③⑬ $\{\mathbf{m}_{-101} 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & y & x \end{pmatrix}$	$\begin{pmatrix} -Z & -Y & -X \end{pmatrix}$
③⑭ $\{\mathbf{m}_{01-1} 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} x & z & y \end{pmatrix}$	$\begin{pmatrix} -X & -Z & -Y \end{pmatrix}$
③⑮ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 229

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑥ $\{-3_{1-1-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & -y \end{pmatrix}$	$\begin{pmatrix} -Z & -X & Y \end{pmatrix}$
③⑦ $\{-3_{-11-1}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & -X & -Y \end{pmatrix}$
③⑧ $\{-3_{-1-11}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -x & y \end{pmatrix}$	$\begin{pmatrix} -Z & X & -Y \end{pmatrix}$
③⑨ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
④⑩ $\{-3_{1-1-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -z & x \end{pmatrix}$	$\begin{pmatrix} -Y & Z & -X \end{pmatrix}$
④⑪ $\{-3_{-11-1}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & -x \end{pmatrix}$	$\begin{pmatrix} -Y & -Z & X \end{pmatrix}$

continued ...

表 229

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④② $\{-3_{-1-11}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & -Z & -X \end{pmatrix}$
④③ $\{-4_{001}^+ 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} y & -x & -z \end{pmatrix}$	$\begin{pmatrix} -Y & X & Z \end{pmatrix}$
④④ $\{-4_{100}^+ 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & z & -y \end{pmatrix}$	$\begin{pmatrix} X & -Z & Y \end{pmatrix}$
④⑤ $\{-4_{010}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -y & x \end{pmatrix}$	$\begin{pmatrix} Z & Y & -X \end{pmatrix}$
④⑥ $\{-4_{001}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & x & -z \end{pmatrix}$	$\begin{pmatrix} Y & -X & Z \end{pmatrix}$
④⑦ $\{-4_{100}^- 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -z & y \end{pmatrix}$	$\begin{pmatrix} X & Z & -Y \end{pmatrix}$

continued ...



表 229

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
$\textcircled{48} \quad \{-4_{010}^- 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & -y & -x \end{pmatrix}$	$\begin{pmatrix} -Z & Y & X \end{pmatrix}$

表 230: No. 230  $O_h^{10}$   $Ia - 3d$  [ cubic ]  $+\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$ ,  
 $+\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
① $\{1 0\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} x & y & z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
② $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & -y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
③ $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & \frac{1}{2} - y & -z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
④ $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -x & y + \frac{1}{2} & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
⑤ $\{2_{110} \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{3}{4} & x + \frac{1}{4} & \frac{1}{4} - z \end{pmatrix}$	$\begin{pmatrix} Y + \frac{3}{4} & X + \frac{1}{4} & \frac{1}{4} - Z \end{pmatrix}$

*continued ...*

表 230

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑥ $\{2_{101} \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & \frac{1}{4} - y & x + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{4} & \frac{1}{4} - Y & X + \frac{3}{4} \end{pmatrix}$
⑦ $\{2_{011} \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - x & z + \frac{3}{4} & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & Z + \frac{3}{4} & Y + \frac{1}{4} \end{pmatrix}$
⑧ $\{2_{1-10} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - y & \frac{3}{4} - x & \frac{3}{4} - z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Y & \frac{3}{4} - X & \frac{3}{4} - Z \end{pmatrix}$
⑨ $\{2_{-101} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - z & \frac{3}{4} - y & \frac{3}{4} - x \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - Z & \frac{3}{4} - Y & \frac{3}{4} - X \end{pmatrix}$
⑩ $\{2_{01-1} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - x & \frac{3}{4} - z & \frac{3}{4} - y \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & \frac{3}{4} - Z & \frac{3}{4} - Y \end{pmatrix}$
⑪ $\{3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z & x & y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 230

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑫ $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-z & -x & y+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Z & -X & Y+\frac{1}{2} \end{pmatrix}$
⑬ $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} z+\frac{1}{2} & \frac{1}{2}-x & -y \end{pmatrix}$	$\begin{pmatrix} Z+\frac{1}{2} & \frac{1}{2}-X & -Y \end{pmatrix}$
⑭ $\{3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -z & x+\frac{1}{2} & \frac{1}{2}-y \end{pmatrix}$	$\begin{pmatrix} -Z & X+\frac{1}{2} & \frac{1}{2}-Y \end{pmatrix}$
⑮ $\{3_{111}^- 0\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y & z & x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
⑯ $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -y & z+\frac{1}{2} & \frac{1}{2}-x \end{pmatrix}$	$\begin{pmatrix} -Y & Z+\frac{1}{2} & \frac{1}{2}-X \end{pmatrix}$
⑰ $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & -z & x+\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-Y & -Z & X+\frac{1}{2} \end{pmatrix}$

continued ...

表 230

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
⑮ $\{3_{-1-11}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & \frac{1}{2} - z & -x \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{2} & \frac{1}{2} - Z & -X \end{pmatrix}$
⑰ $\{4_{001}^+ \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & x + \frac{3}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & X + \frac{3}{4} & Z + \frac{1}{4} \end{pmatrix}$
⑳ $\{4_{100}^+ \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & \frac{1}{4} - z & y + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{4} & \frac{1}{4} - Z & Y + \frac{3}{4} \end{pmatrix}$
㉑ $\{4_{010}^+ \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{3}{4} & y + \frac{1}{4} & \frac{1}{4} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{3}{4} & Y + \frac{1}{4} & \frac{1}{4} - X \end{pmatrix}$
㉒ $\{4_{001}^- \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & \frac{1}{4} - x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & \frac{1}{4} - X & Z + \frac{3}{4} \end{pmatrix}$
㉓ $\{4_{100}^- \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & z + \frac{1}{4} & \frac{1}{4} - y \end{pmatrix}$	$\begin{pmatrix} X + \frac{3}{4} & Z + \frac{1}{4} & \frac{1}{4} - Y \end{pmatrix}$

continued ...

表 230

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
②④ $\{4_{010}^- \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - z & y + \frac{3}{4} & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & Y + \frac{3}{4} & X + \frac{1}{4} \end{pmatrix}$
②⑤ $\{-1 0\}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -x & -y & -z \end{pmatrix}$	$\begin{pmatrix} X & Y & Z \end{pmatrix}$
②⑥ $\{m_{001} \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{2} & y & \frac{1}{2} - z \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - X & -Y & Z + \frac{1}{2} \end{pmatrix}$
②⑦ $\{m_{100} \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - x & y + \frac{1}{2} & z \end{pmatrix}$	$\begin{pmatrix} X + \frac{1}{2} & \frac{1}{2} - Y & -Z \end{pmatrix}$
②⑧ $\{m_{010} 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} x & \frac{1}{2} - y & z + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -X & Y + \frac{1}{2} & \frac{1}{2} - Z \end{pmatrix}$
②⑨ $\{m_{110} \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - y & \frac{3}{4} - x & z + \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Y + \frac{1}{4} & X + \frac{3}{4} & \frac{3}{4} - Z \end{pmatrix}$

continued ...

表 230

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑩ $\{m_{101} \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - z & y + \frac{3}{4} & \frac{1}{4} - x \end{pmatrix}$	$\begin{pmatrix} Z + \frac{3}{4} & \frac{3}{4} - Y & X + \frac{1}{4} \end{pmatrix}$
③⑪ $\{m_{011} \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{3}{4} & \frac{1}{4} - z & \frac{3}{4} - y \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4} - X & Z + \frac{1}{4} & Y + \frac{3}{4} \end{pmatrix}$
③⑫ $\{m_{1-10} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{4} & x + \frac{1}{4} & z + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Y & \frac{1}{4} - X & \frac{1}{4} - Z \end{pmatrix}$
③⑬ $\{m_{-101} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{4} & y + \frac{1}{4} & x + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - Z & \frac{1}{4} - Y & \frac{1}{4} - X \end{pmatrix}$
③⑭ $\{m_{01-1} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} x + \frac{1}{4} & z + \frac{1}{4} & y + \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4} - X & \frac{1}{4} - Z & \frac{1}{4} - Y \end{pmatrix}$
③⑮ $\{-3_{111}^+ 0\}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -z & -x & -y \end{pmatrix}$	$\begin{pmatrix} Z & X & Y \end{pmatrix}$

continued ...

表 230

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
③⑥ $\{-3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z + \frac{1}{2} & x & \frac{1}{2} - y \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Z & -X & Y + \frac{1}{2} \end{pmatrix}$
③⑦ $\{-3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - z & x + \frac{1}{2} & y \end{pmatrix}$	$\begin{pmatrix} Z + \frac{1}{2} & \frac{1}{2} - X & -Y \end{pmatrix}$
③⑧ $\{-3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} z & \frac{1}{2} - x & y + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Z & X + \frac{1}{2} & \frac{1}{2} - Y \end{pmatrix}$
③⑨ $\{-3_{111}^- 0\}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -y & -z & -x \end{pmatrix}$	$\begin{pmatrix} Y & Z & X \end{pmatrix}$
④⑩ $\{-3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y & \frac{1}{2} - z & x + \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -Y & Z + \frac{1}{2} & \frac{1}{2} - X \end{pmatrix}$
④⑪ $\{-3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} y + \frac{1}{2} & z & \frac{1}{2} - x \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} - Y & -Z & X + \frac{1}{2} \end{pmatrix}$

continued ...



表 230

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④② $\{-3_{-1-11}^- \frac{1}{2}\frac{1}{2}0\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2}-y & z+\frac{1}{2} & x \end{pmatrix}$	$\begin{pmatrix} Y+\frac{1}{2} & \frac{1}{2}-Z & -X \end{pmatrix}$
④③ $\{-4_{001}^+ \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} y+\frac{3}{4} & \frac{1}{4}-x & \frac{3}{4}-z \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-Y & X+\frac{1}{4} & Z+\frac{3}{4} \end{pmatrix}$
④④ $\{-4_{100}^+ \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-x & z+\frac{3}{4} & \frac{1}{4}-y \end{pmatrix}$	$\begin{pmatrix} X+\frac{3}{4} & \frac{3}{4}-Z & Y+\frac{1}{4} \end{pmatrix}$
④⑤ $\{-4_{010}^+ \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-z & \frac{3}{4}-y & x+\frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} Z+\frac{1}{4} & Y+\frac{3}{4} & \frac{3}{4}-X \end{pmatrix}$
④⑥ $\{-4_{001}^- \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$	$\begin{pmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{3}{4}-y & x+\frac{3}{4} & \frac{1}{4}-z \end{pmatrix}$	$\begin{pmatrix} Y+\frac{3}{4} & \frac{3}{4}-X & Z+\frac{1}{4} \end{pmatrix}$
④⑦ $\{-4_{100}^- \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$	$\begin{pmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{4}-x & \frac{3}{4}-z & y+\frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} X+\frac{1}{4} & Z+\frac{3}{4} & \frac{3}{4}-Y \end{pmatrix}$

continued ...

表 230

sym. op.	polar vector	axial vector	EP (polar)	EP (axial)
④⑧ $\{-4^-_{010} \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$	$\begin{pmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{pmatrix}$	$\left(z + \frac{3}{4} \quad \frac{1}{4} - y \quad \frac{3}{4} - x\right)$	$\left(\frac{3}{4} - Z \quad Y + \frac{1}{4} \quad X + \frac{3}{4}\right)$