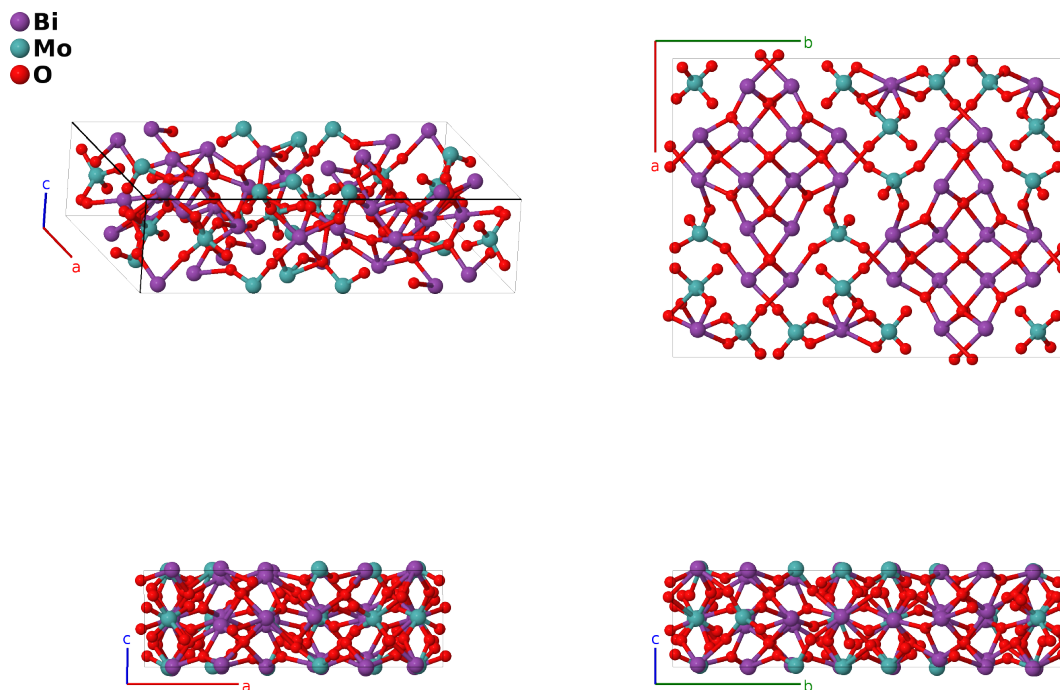


# High temperature $\text{Bi}_2\text{MoO}_6$ Structure: A2BC6\_mP144\_14\_8e\_4e\_24e-001

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<https://aflow.org/p/UYPX>

[https://aflow.org/p/A2BC6\\_mP144\\_14\\_8e\\_4e\\_24e-001](https://aflow.org/p/A2BC6_mP144_14_8e_4e_24e-001)



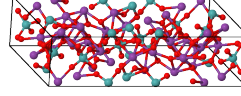
Prototype	$\text{Bi}_2\text{MoO}_6$
AFLOW prototype label	A2BC6_mP144_14_8e_4e_24e-001
ICSD	78179
Pearson symbol	mP144
Space group number	14
Space group symbol	$P2_1/c$
AFLOW prototype command	<pre>aflow --proto=A2BC6_mP144_14_8e_4e_24e-001 --params=a, b/a, c/a, <math>\beta</math>, <math>x_1, y_1, z_1, x_2, y_2, z_2, x_3, y_3, z_3, x_4, y_4, z_4, x_5, y_5, z_5, x_6, y_6, z_6, x_7, y_7, z_7, x_8, y_8, z_8, x_9, y_9, z_9, x_{10}, y_{10}, z_{10}, x_{11}, y_{11}, z_{11}, x_{12}, y_{12}, z_{12}, x_{13}, y_{13}, z_{13}, x_{14}, y_{14}, z_{14}, x_{15}, y_{15}, z_{15}, x_{16}, y_{16}, z_{16}, x_{17}, y_{17}, z_{17}, x_{18}, y_{18}, z_{18}, x_{19}, y_{19}, z_{19}, x_{20}, y_{20}, z_{20}, x_{21}, y_{21}, z_{21}, x_{22}, y_{22}, z_{22}, x_{23}, y_{23}, z_{23}, x_{24}, y_{24}, z_{24}, x_{25}, y_{25}, z_{25}, x_{26}, y_{26}, z_{26}, x_{27}, y_{27}, z_{27}, x_{28}, y_{28}, z_{28}, x_{29}, y_{29}, z_{29}, x_{30}, y_{30}, z_{30}, x_{31}, y_{31}, z_{31}, x_{32}, y_{32}, z_{32}, x_{33}, y_{33}, z_{33}, x_{34}, y_{34}, z_{34}, x_{35}, y_{35}, z_{35}, x_{36}, y_{36}, z_{36}</math></pre>

- This is the high temperature monoclinic structure of  $\text{Bi}_2\text{MoO}_6$ , stable above  $896^\circ\text{C}$ . Below that it transforms to the room-temperature koechlinite structure (Villars, 2018).

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### Simple Monoclinic primitive vectors

$$\begin{aligned} \mathbf{a}_1 &= a \hat{\mathbf{x}} \\ \mathbf{a}_2 &= b \hat{\mathbf{y}} \\ \mathbf{a}_3 &= c \cos \beta \hat{\mathbf{x}} + c \sin \beta \hat{\mathbf{z}} \end{aligned}$$




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### Basis vectors

	Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B}_1$	$x_1 \mathbf{a}_1 + y_1 \mathbf{a}_2 + z_1 \mathbf{a}_3$	=	$(ax_1 + cz_1 \cos \beta) \hat{\mathbf{x}} + by_1 \hat{\mathbf{y}} + cz_1 \sin \beta \hat{\mathbf{z}}$	(4e)	Bi I
$\mathbf{B}_2$	$-x_1 \mathbf{a}_1 + (y_1 + \frac{1}{2}) \mathbf{a}_2 - (z_1 - \frac{1}{2}) \mathbf{a}_3$	=	$-(ax_1 + c(z_1 - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + b(y_1 + \frac{1}{2}) \hat{\mathbf{y}} - c(z_1 - \frac{1}{2}) \sin \beta \hat{\mathbf{z}}$	(4e)	Bi I
$\mathbf{B}_3$	$-x_1 \mathbf{a}_1 - y_1 \mathbf{a}_2 - z_1 \mathbf{a}_3$	=	$-(ax_1 + cz_1 \cos \beta) \hat{\mathbf{x}} - by_1 \hat{\mathbf{y}} - cz_1 \sin \beta \hat{\mathbf{z}}$	(4e)	Bi I
$\mathbf{B}_4$	$x_1 \mathbf{a}_1 - (y_1 - \frac{1}{2}) \mathbf{a}_2 + (z_1 + \frac{1}{2}) \mathbf{a}_3$	=	$(ax_1 + c(z_1 + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - b(y_1 - \frac{1}{2}) \hat{\mathbf{y}} + c(z_1 + \frac{1}{2}) \sin \beta \hat{\mathbf{z}}$	(4e)	Bi I
$\mathbf{B}_5$	$x_2 \mathbf{a}_1 + y_2 \mathbf{a}_2 + z_2 \mathbf{a}_3$	=	$(ax_2 + cz_2 \cos \beta) \hat{\mathbf{x}} + by_2 \hat{\mathbf{y}} + cz_2 \sin \beta \hat{\mathbf{z}}$	(4e)	Bi II
$\mathbf{B}_6$	$-x_2 \mathbf{a}_1 + (y_2 + \frac{1}{2}) \mathbf{a}_2 - (z_2 - \frac{1}{2}) \mathbf{a}_3$	=	$-(ax_2 + c(z_2 - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + b(y_2 + \frac{1}{2}) \hat{\mathbf{y}} - c(z_2 - \frac{1}{2}) \sin \beta \hat{\mathbf{z}}$	(4e)	Bi II
$\mathbf{B}_7$	$-x_2 \mathbf{a}_1 - y_2 \mathbf{a}_2 - z_2 \mathbf{a}_3$	=	$-(ax_2 + cz_2 \cos \beta) \hat{\mathbf{x}} - by_2 \hat{\mathbf{y}} - cz_2 \sin \beta \hat{\mathbf{z}}$	(4e)	Bi II
$\mathbf{B}_8$	$x_2 \mathbf{a}_1 - (y_2 - \frac{1}{2}) \mathbf{a}_2 + (z_2 + \frac{1}{2}) \mathbf{a}_3$	=	$(ax_2 + c(z_2 + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - b(y_2 - \frac{1}{2}) \hat{\mathbf{y}} + c(z_2 + \frac{1}{2}) \sin \beta \hat{\mathbf{z}}$	(4e)	Bi II
$\mathbf{B}_9$	$x_3 \mathbf{a}_1 + y_3 \mathbf{a}_2 + z_3 \mathbf{a}_3$	=	$(ax_3 + cz_3 \cos \beta) \hat{\mathbf{x}} + by_3 \hat{\mathbf{y}} + cz_3 \sin \beta \hat{\mathbf{z}}$	(4e)	Bi III
$\mathbf{B}_{10}$	$-x_3 \mathbf{a}_1 + (y_3 + \frac{1}{2}) \mathbf{a}_2 - (z_3 - \frac{1}{2}) \mathbf{a}_3$	=	$-(ax_3 + c(z_3 - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + b(y_3 + \frac{1}{2}) \hat{\mathbf{y}} - c(z_3 - \frac{1}{2}) \sin \beta \hat{\mathbf{z}}$	(4e)	Bi III
$\mathbf{B}_{11}$	$-x_3 \mathbf{a}_1 - y_3 \mathbf{a}_2 - z_3 \mathbf{a}_3$	=	$-(ax_3 + cz_3 \cos \beta) \hat{\mathbf{x}} - by_3 \hat{\mathbf{y}} - cz_3 \sin \beta \hat{\mathbf{z}}$	(4e)	Bi III
$\mathbf{B}_{12}$	$x_3 \mathbf{a}_1 - (y_3 - \frac{1}{2}) \mathbf{a}_2 + (z_3 + \frac{1}{2}) \mathbf{a}_3$	=	$(ax_3 + c(z_3 + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - b(y_3 - \frac{1}{2}) \hat{\mathbf{y}} + c(z_3 + \frac{1}{2}) \sin \beta \hat{\mathbf{z}}$	(4e)	Bi III
$\mathbf{B}_{13}$	$x_4 \mathbf{a}_1 + y_4 \mathbf{a}_2 + z_4 \mathbf{a}_3$	=	$(ax_4 + cz_4 \cos \beta) \hat{\mathbf{x}} + by_4 \hat{\mathbf{y}} + cz_4 \sin \beta \hat{\mathbf{z}}$	(4e)	Bi IV
$\mathbf{B}_{14}$	$-x_4 \mathbf{a}_1 + (y_4 + \frac{1}{2}) \mathbf{a}_2 - (z_4 - \frac{1}{2}) \mathbf{a}_3$	=	$-(ax_4 + c(z_4 - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + b(y_4 + \frac{1}{2}) \hat{\mathbf{y}} - c(z_4 - \frac{1}{2}) \sin \beta \hat{\mathbf{z}}$	(4e)	Bi IV
$\mathbf{B}_{15}$	$-x_4 \mathbf{a}_1 - y_4 \mathbf{a}_2 - z_4 \mathbf{a}_3$	=	$-(ax_4 + cz_4 \cos \beta) \hat{\mathbf{x}} - by_4 \hat{\mathbf{y}} - cz_4 \sin \beta \hat{\mathbf{z}}$	(4e)	Bi IV
$\mathbf{B}_{16}$	$x_4 \mathbf{a}_1 - (y_4 - \frac{1}{2}) \mathbf{a}_2 + (z_4 + \frac{1}{2}) \mathbf{a}_3$	=	$(ax_4 + c(z_4 + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - b(y_4 - \frac{1}{2}) \hat{\mathbf{y}} + c(z_4 + \frac{1}{2}) \sin \beta \hat{\mathbf{z}}$	(4e)	Bi IV
$\mathbf{B}_{17}$	$x_5 \mathbf{a}_1 + y_5 \mathbf{a}_2 + z_5 \mathbf{a}_3$	=	$(ax_5 + cz_5 \cos \beta) \hat{\mathbf{x}} + by_5 \hat{\mathbf{y}} + cz_5 \sin \beta \hat{\mathbf{z}}$	(4e)	Bi V
$\mathbf{B}_{18}$	$-x_5 \mathbf{a}_1 + (y_5 + \frac{1}{2}) \mathbf{a}_2 - (z_5 - \frac{1}{2}) \mathbf{a}_3$	=	$-(ax_5 + c(z_5 - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + b(y_5 + \frac{1}{2}) \hat{\mathbf{y}} - c(z_5 - \frac{1}{2}) \sin \beta \hat{\mathbf{z}}$	(4e)	Bi V
$\mathbf{B}_{19}$	$-x_5 \mathbf{a}_1 - y_5 \mathbf{a}_2 - z_5 \mathbf{a}_3$	=	$-(ax_5 + cz_5 \cos \beta) \hat{\mathbf{x}} - by_5 \hat{\mathbf{y}} - cz_5 \sin \beta \hat{\mathbf{z}}$	(4e)	Bi V
$\mathbf{B}_{20}$	$x_5 \mathbf{a}_1 - (y_5 - \frac{1}{2}) \mathbf{a}_2 + (z_5 + \frac{1}{2}) \mathbf{a}_3$	=	$(ax_5 + c(z_5 + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - b(y_5 - \frac{1}{2}) \hat{\mathbf{y}} + c(z_5 + \frac{1}{2}) \sin \beta \hat{\mathbf{z}}$	(4e)	Bi V

$$\begin{aligned}
\mathbf{B}_{21} &= x_6 \mathbf{a}_1 + y_6 \mathbf{a}_2 + z_6 \mathbf{a}_3 &= (ax_6 + cz_6 \cos \beta) \hat{\mathbf{x}} + by_6 \hat{\mathbf{y}} + cz_6 \sin \beta \hat{\mathbf{z}} &(4e) &\text{Bi VI} \\
\mathbf{B}_{22} &= -x_6 \mathbf{a}_1 + (y_6 + \frac{1}{2}) \mathbf{a}_2 - &= -(ax_6 + c(z_6 - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + &(4e) &\text{Bi VI} \\
&\quad (z_6 - \frac{1}{2}) \mathbf{a}_3 &\quad b(y_6 + \frac{1}{2}) \hat{\mathbf{y}} - c(z_6 - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{23} &= -x_6 \mathbf{a}_1 - y_6 \mathbf{a}_2 - z_6 \mathbf{a}_3 &= -(ax_6 + cz_6 \cos \beta) \hat{\mathbf{x}} - by_6 \hat{\mathbf{y}} - cz_6 \sin \beta \hat{\mathbf{z}} &(4e) &\text{Bi VI} \\
\mathbf{B}_{24} &= x_6 \mathbf{a}_1 - (y_6 - \frac{1}{2}) \mathbf{a}_2 + (z_6 + \frac{1}{2}) \mathbf{a}_3 &= (ax_6 + c(z_6 + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - &(4e) &\text{Bi VI} \\
&\quad b(y_6 - \frac{1}{2}) \hat{\mathbf{y}} + c(z_6 + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{25} &= x_7 \mathbf{a}_1 + y_7 \mathbf{a}_2 + z_7 \mathbf{a}_3 &= (ax_7 + cz_7 \cos \beta) \hat{\mathbf{x}} + by_7 \hat{\mathbf{y}} + cz_7 \sin \beta \hat{\mathbf{z}} &(4e) &\text{Bi VII} \\
\mathbf{B}_{26} &= -x_7 \mathbf{a}_1 + (y_7 + \frac{1}{2}) \mathbf{a}_2 - &= -(ax_7 + c(z_7 - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + &(4e) &\text{Bi VII} \\
&\quad (z_7 - \frac{1}{2}) \mathbf{a}_3 &\quad b(y_7 + \frac{1}{2}) \hat{\mathbf{y}} - c(z_7 - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{27} &= -x_7 \mathbf{a}_1 - y_7 \mathbf{a}_2 - z_7 \mathbf{a}_3 &= -(ax_7 + cz_7 \cos \beta) \hat{\mathbf{x}} - by_7 \hat{\mathbf{y}} - cz_7 \sin \beta \hat{\mathbf{z}} &(4e) &\text{Bi VII} \\
\mathbf{B}_{28} &= x_7 \mathbf{a}_1 - (y_7 - \frac{1}{2}) \mathbf{a}_2 + (z_7 + \frac{1}{2}) \mathbf{a}_3 &= (ax_7 + c(z_7 + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - &(4e) &\text{Bi VII} \\
&\quad b(y_7 - \frac{1}{2}) \hat{\mathbf{y}} + c(z_7 + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{29} &= x_8 \mathbf{a}_1 + y_8 \mathbf{a}_2 + z_8 \mathbf{a}_3 &= (ax_8 + cz_8 \cos \beta) \hat{\mathbf{x}} + by_8 \hat{\mathbf{y}} + cz_8 \sin \beta \hat{\mathbf{z}} &(4e) &\text{Bi VIII} \\
\mathbf{B}_{30} &= -x_8 \mathbf{a}_1 + (y_8 + \frac{1}{2}) \mathbf{a}_2 - &= -(ax_8 + c(z_8 - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + &(4e) &\text{Bi VIII} \\
&\quad (z_8 - \frac{1}{2}) \mathbf{a}_3 &\quad b(y_8 + \frac{1}{2}) \hat{\mathbf{y}} - c(z_8 - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{31} &= -x_8 \mathbf{a}_1 - y_8 \mathbf{a}_2 - z_8 \mathbf{a}_3 &= -(ax_8 + cz_8 \cos \beta) \hat{\mathbf{x}} - by_8 \hat{\mathbf{y}} - cz_8 \sin \beta \hat{\mathbf{z}} &(4e) &\text{Bi VIII} \\
\mathbf{B}_{32} &= x_8 \mathbf{a}_1 - (y_8 - \frac{1}{2}) \mathbf{a}_2 + (z_8 + \frac{1}{2}) \mathbf{a}_3 &= (ax_8 + c(z_8 + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - &(4e) &\text{Bi VIII} \\
&\quad b(y_8 - \frac{1}{2}) \hat{\mathbf{y}} + c(z_8 + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{33} &= x_9 \mathbf{a}_1 + y_9 \mathbf{a}_2 + z_9 \mathbf{a}_3 &= (ax_9 + cz_9 \cos \beta) \hat{\mathbf{x}} + by_9 \hat{\mathbf{y}} + cz_9 \sin \beta \hat{\mathbf{z}} &(4e) &\text{Mo I} \\
\mathbf{B}_{34} &= -x_9 \mathbf{a}_1 + (y_9 + \frac{1}{2}) \mathbf{a}_2 - &= -(ax_9 + c(z_9 - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + &(4e) &\text{Mo I} \\
&\quad (z_9 - \frac{1}{2}) \mathbf{a}_3 &\quad b(y_9 + \frac{1}{2}) \hat{\mathbf{y}} - c(z_9 - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{35} &= -x_9 \mathbf{a}_1 - y_9 \mathbf{a}_2 - z_9 \mathbf{a}_3 &= -(ax_9 + cz_9 \cos \beta) \hat{\mathbf{x}} - by_9 \hat{\mathbf{y}} - cz_9 \sin \beta \hat{\mathbf{z}} &(4e) &\text{Mo I} \\
\mathbf{B}_{36} &= x_9 \mathbf{a}_1 - (y_9 - \frac{1}{2}) \mathbf{a}_2 + (z_9 + \frac{1}{2}) \mathbf{a}_3 &= (ax_9 + c(z_9 + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - &(4e) &\text{Mo I} \\
&\quad b(y_9 - \frac{1}{2}) \hat{\mathbf{y}} + c(z_9 + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{37} &= x_{10} \mathbf{a}_1 + y_{10} \mathbf{a}_2 + z_{10} \mathbf{a}_3 &= (ax_{10} + cz_{10} \cos \beta) \hat{\mathbf{x}} + by_{10} \hat{\mathbf{y}} + cz_{10} \sin \beta \hat{\mathbf{z}} &(4e) &\text{Mo II} \\
\mathbf{B}_{38} &= -x_{10} \mathbf{a}_1 + (y_{10} + \frac{1}{2}) \mathbf{a}_2 - &= -(ax_{10} + c(z_{10} - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + &(4e) &\text{Mo II} \\
&\quad (z_{10} - \frac{1}{2}) \mathbf{a}_3 &\quad b(y_{10} + \frac{1}{2}) \hat{\mathbf{y}} - c(z_{10} - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{39} &= -x_{10} \mathbf{a}_1 - y_{10} \mathbf{a}_2 - z_{10} \mathbf{a}_3 &= -(ax_{10} + cz_{10} \cos \beta) \hat{\mathbf{x}} - by_{10} \hat{\mathbf{y}} - &(4e) &\text{Mo II} \\
&\quad cz_{10} \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{40} &= x_{10} \mathbf{a}_1 - (y_{10} - \frac{1}{2}) \mathbf{a}_2 + &= (ax_{10} + c(z_{10} + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - &(4e) &\text{Mo II} \\
&\quad (z_{10} + \frac{1}{2}) \mathbf{a}_3 &\quad b(y_{10} - \frac{1}{2}) \hat{\mathbf{y}} + c(z_{10} + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{41} &= x_{11} \mathbf{a}_1 + y_{11} \mathbf{a}_2 + z_{11} \mathbf{a}_3 &= (ax_{11} + cz_{11} \cos \beta) \hat{\mathbf{x}} + by_{11} \hat{\mathbf{y}} + cz_{11} \sin \beta \hat{\mathbf{z}} &(4e) &\text{Mo III} \\
\mathbf{B}_{42} &= -x_{11} \mathbf{a}_1 + (y_{11} + \frac{1}{2}) \mathbf{a}_2 - &= -(ax_{11} + c(z_{11} - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + &(4e) &\text{Mo III} \\
&\quad (z_{11} - \frac{1}{2}) \mathbf{a}_3 &\quad b(y_{11} + \frac{1}{2}) \hat{\mathbf{y}} - c(z_{11} - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{43} &= -x_{11} \mathbf{a}_1 - y_{11} \mathbf{a}_2 - z_{11} \mathbf{a}_3 &= -(ax_{11} + cz_{11} \cos \beta) \hat{\mathbf{x}} - by_{11} \hat{\mathbf{y}} - &(4e) &\text{Mo III} \\
&\quad cz_{11} \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{44} &= x_{11} \mathbf{a}_1 - (y_{11} - \frac{1}{2}) \mathbf{a}_2 + &= (ax_{11} + c(z_{11} + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - &(4e) &\text{Mo III} \\
&\quad (z_{11} + \frac{1}{2}) \mathbf{a}_3 &\quad b(y_{11} - \frac{1}{2}) \hat{\mathbf{y}} + c(z_{11} + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{45} &= x_{12} \mathbf{a}_1 + y_{12} \mathbf{a}_2 + z_{12} \mathbf{a}_3 &= (ax_{12} + cz_{12} \cos \beta) \hat{\mathbf{x}} + by_{12} \hat{\mathbf{y}} + cz_{12} \sin \beta \hat{\mathbf{z}} &(4e) &\text{Mo IV} \\
\mathbf{B}_{46} &= -x_{12} \mathbf{a}_1 + (y_{12} + \frac{1}{2}) \mathbf{a}_2 - &= -(ax_{12} + c(z_{12} - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + &(4e) &\text{Mo IV} \\
&\quad (z_{12} - \frac{1}{2}) \mathbf{a}_3 &\quad b(y_{12} + \frac{1}{2}) \hat{\mathbf{y}} - c(z_{12} - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{47} &= -x_{12} \mathbf{a}_1 - y_{12} \mathbf{a}_2 - z_{12} \mathbf{a}_3 &= -(ax_{12} + cz_{12} \cos \beta) \hat{\mathbf{x}} - by_{12} \hat{\mathbf{y}} - &(4e) &\text{Mo IV} \\
&\quad cz_{12} \sin \beta \hat{\mathbf{z}} \\
\mathbf{B}_{48} &= x_{12} \mathbf{a}_1 - (y_{12} - \frac{1}{2}) \mathbf{a}_2 + &= (ax_{12} + c(z_{12} + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - &(4e) &\text{Mo IV} \\
&\quad (z_{12} + \frac{1}{2}) \mathbf{a}_3 &\quad b(y_{12} - \frac{1}{2}) \hat{\mathbf{y}} + c(z_{12} + \frac{1}{2}) \sin \beta \hat{\mathbf{z}}
\end{aligned}$$







$$\begin{aligned}
\mathbf{B}_{127} &= -x_{32} \mathbf{a}_1 - y_{32} \mathbf{a}_2 - z_{32} \mathbf{a}_3 &= & - (ax_{32} + cz_{32} \cos \beta) \hat{\mathbf{x}} - by_{32} \hat{\mathbf{y}} - cz_{32} \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XX} \\
\mathbf{B}_{128} &= x_{32} \mathbf{a}_1 - (y_{32} - \frac{1}{2}) \mathbf{a}_2 + (z_{32} + \frac{1}{2}) \mathbf{a}_3 &= & (ax_{32} + c(z_{32} + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - b(y_{32} - \frac{1}{2}) \hat{\mathbf{y}} + c(z_{32} + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XX} \\
\mathbf{B}_{129} &= x_{33} \mathbf{a}_1 + y_{33} \mathbf{a}_2 + z_{33} \mathbf{a}_3 &= & (ax_{33} + cz_{33} \cos \beta) \hat{\mathbf{x}} + by_{33} \hat{\mathbf{y}} + cz_{33} \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXI} \\
\mathbf{B}_{130} &= -x_{33} \mathbf{a}_1 + (y_{33} + \frac{1}{2}) \mathbf{a}_2 - (z_{33} - \frac{1}{2}) \mathbf{a}_3 &= & - (ax_{33} + c(z_{33} - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + b(y_{33} + \frac{1}{2}) \hat{\mathbf{y}} - c(z_{33} - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXI} \\
\mathbf{B}_{131} &= -x_{33} \mathbf{a}_1 - y_{33} \mathbf{a}_2 - z_{33} \mathbf{a}_3 &= & - (ax_{33} + cz_{33} \cos \beta) \hat{\mathbf{x}} - by_{33} \hat{\mathbf{y}} - cz_{33} \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXI} \\
\mathbf{B}_{132} &= x_{33} \mathbf{a}_1 - (y_{33} - \frac{1}{2}) \mathbf{a}_2 + (z_{33} + \frac{1}{2}) \mathbf{a}_3 &= & (ax_{33} + c(z_{33} + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - b(y_{33} - \frac{1}{2}) \hat{\mathbf{y}} + c(z_{33} + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXI} \\
\mathbf{B}_{133} &= x_{34} \mathbf{a}_1 + y_{34} \mathbf{a}_2 + z_{34} \mathbf{a}_3 &= & (ax_{34} + cz_{34} \cos \beta) \hat{\mathbf{x}} + by_{34} \hat{\mathbf{y}} + cz_{34} \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXII} \\
\mathbf{B}_{134} &= -x_{34} \mathbf{a}_1 + (y_{34} + \frac{1}{2}) \mathbf{a}_2 - (z_{34} - \frac{1}{2}) \mathbf{a}_3 &= & - (ax_{34} + c(z_{34} - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + b(y_{34} + \frac{1}{2}) \hat{\mathbf{y}} - c(z_{34} - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXII} \\
\mathbf{B}_{135} &= -x_{34} \mathbf{a}_1 - y_{34} \mathbf{a}_2 - z_{34} \mathbf{a}_3 &= & - (ax_{34} + cz_{34} \cos \beta) \hat{\mathbf{x}} - by_{34} \hat{\mathbf{y}} - cz_{34} \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXII} \\
\mathbf{B}_{136} &= x_{34} \mathbf{a}_1 - (y_{34} - \frac{1}{2}) \mathbf{a}_2 + (z_{34} + \frac{1}{2}) \mathbf{a}_3 &= & (ax_{34} + c(z_{34} + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - b(y_{34} - \frac{1}{2}) \hat{\mathbf{y}} + c(z_{34} + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXII} \\
\mathbf{B}_{137} &= x_{35} \mathbf{a}_1 + y_{35} \mathbf{a}_2 + z_{35} \mathbf{a}_3 &= & (ax_{35} + cz_{35} \cos \beta) \hat{\mathbf{x}} + by_{35} \hat{\mathbf{y}} + cz_{35} \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXIII} \\
\mathbf{B}_{138} &= -x_{35} \mathbf{a}_1 + (y_{35} + \frac{1}{2}) \mathbf{a}_2 - (z_{35} - \frac{1}{2}) \mathbf{a}_3 &= & - (ax_{35} + c(z_{35} - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + b(y_{35} + \frac{1}{2}) \hat{\mathbf{y}} - c(z_{35} - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXIII} \\
\mathbf{B}_{139} &= -x_{35} \mathbf{a}_1 - y_{35} \mathbf{a}_2 - z_{35} \mathbf{a}_3 &= & - (ax_{35} + cz_{35} \cos \beta) \hat{\mathbf{x}} - by_{35} \hat{\mathbf{y}} - cz_{35} \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXIII} \\
\mathbf{B}_{140} &= x_{35} \mathbf{a}_1 - (y_{35} - \frac{1}{2}) \mathbf{a}_2 + (z_{35} + \frac{1}{2}) \mathbf{a}_3 &= & (ax_{35} + c(z_{35} + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - b(y_{35} - \frac{1}{2}) \hat{\mathbf{y}} + c(z_{35} + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXIII} \\
\mathbf{B}_{141} &= x_{36} \mathbf{a}_1 + y_{36} \mathbf{a}_2 + z_{36} \mathbf{a}_3 &= & (ax_{36} + cz_{36} \cos \beta) \hat{\mathbf{x}} + by_{36} \hat{\mathbf{y}} + cz_{36} \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXIV} \\
\mathbf{B}_{142} &= -x_{36} \mathbf{a}_1 + (y_{36} + \frac{1}{2}) \mathbf{a}_2 - (z_{36} - \frac{1}{2}) \mathbf{a}_3 &= & - (ax_{36} + c(z_{36} - \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} + b(y_{36} + \frac{1}{2}) \hat{\mathbf{y}} - c(z_{36} - \frac{1}{2}) \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXIV} \\
\mathbf{B}_{143} &= -x_{36} \mathbf{a}_1 - y_{36} \mathbf{a}_2 - z_{36} \mathbf{a}_3 &= & - (ax_{36} + cz_{36} \cos \beta) \hat{\mathbf{x}} - by_{36} \hat{\mathbf{y}} - cz_{36} \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXIV} \\
\mathbf{B}_{144} &= x_{36} \mathbf{a}_1 - (y_{36} - \frac{1}{2}) \mathbf{a}_2 + (z_{36} + \frac{1}{2}) \mathbf{a}_3 &= & (ax_{36} + c(z_{36} + \frac{1}{2}) \cos \beta) \hat{\mathbf{x}} - b(y_{36} - \frac{1}{2}) \hat{\mathbf{y}} + c(z_{36} + \frac{1}{2}) \sin \beta \hat{\mathbf{z}} & (4e) & \text{O XXIV}
\end{aligned}$$

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