Low Temperature Mo_8O_{23} Structure: A8B23_mP124_7_16a_46a-001

This structure previously used the label(s) `A8B23_mP124_7_16a_46a`. Calls to these addresses will be redirected here.

Cite this page as:

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- D. Hicks, M. J. Mehl, M. Esters, C. Oses, O. Levy, G. L. W. Hart, C. Toher, and S. Curtarolo, *The AFLOW Library of Crystallographic Prototypes: Part 3*, Comput. Mater. Sci. **199**, 110450 (2021), doi: 10.1016/j.commatsci.2021.110450.

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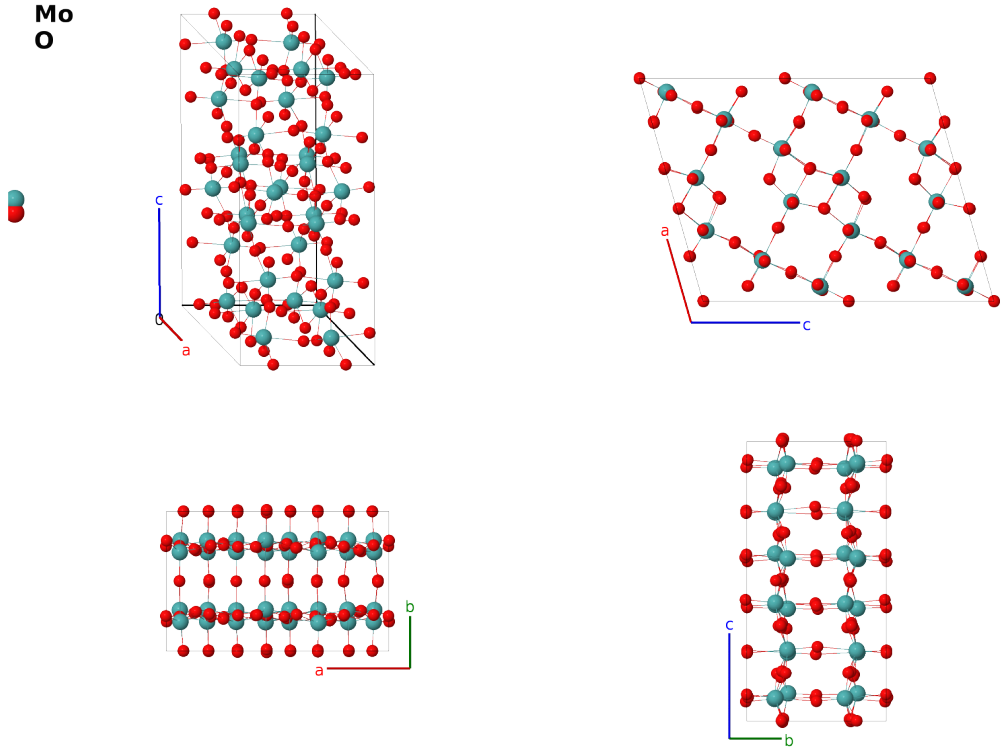
https://aflow.org/prototype-encyclopedia/5T76

https://aflow.org/prototype-encyclopedia/A8B23_mP124_7_16a_46a-001



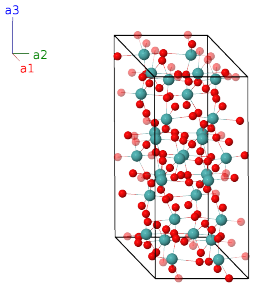
Prototype	Mo_8O_{23}
AFLOW prototype label	A8B23_mP124_7_16a_46a-001
ICSD	202203
CCDC	1706790
Pearson symbol	mP124
Space group number	7
Space group symbol	Pc
AFLOW prototype command	`aflow --proto=A8B23_mP124_7_16a_46a-001 --params=`$a, b/a, c/a, \beta, x_1, y_1, z_1, x_2, y_2, z_2, x_3, y_3, z_3, x_4, y_4, z_4, x_5, y_5, z_5, x_6, y_6, z_6, x_7, y_7, z_7, x_8, y_8, z_8, x_9, y_9, z_9, x_{10}, y_{10}, z_{10}, x_{11}, y_{11}, z_{11}, x_{12}, y_{12}, z_{12}, x_{13}, y_{13}, z_{13}, x_{14}, y_{14}, z_{14}, x_{15},$

$y_{15}, z_{15}, x_{16}, y_{16}, z_{16}, x_{17}, y_{17}, z_{17}, x_{18}, y_{18}, z_{18}, x_{19}, y_{19}, z_{19}, x_{20}, y_{20}, z_{20}, x_{21}, y_{21}, z_{21}, x_{22}, y_{22}, z_{22}, x_{23}, y_{23}, z_{23}, x_{24}, y_{24}, z_{24}, x_{25}, y_{25}, z_{25}, x_{26}, y_{26}, z_{26}, x_{27}, y_{27}, z_{27}, x_{28}, y_{28}, z_{28}, x_{29}, y_{29}, z_{29}, x_{30}, y_{30}, z_{30}, x_{31}, y_{31}, z_{31}, x_{32}, y_{32}, z_{32}, x_{33}, y_{33}, z_{33}, x_{34}, y_{34}, z_{34}, x_{35}, y_{35}, z_{35}, x_{36}, y_{36}, z_{36}, x_{37}, y_{37}, z_{37}, x_{38}, y_{38}, z_{38}, x_{39}, y_{39}, z_{39}, x_{40}, y_{40}, z_{40}, x_{41}, y_{41}, z_{41}, x_{42}, y_{42}, z_{42}, x_{43}, y_{43}, z_{43}, x_{44}, y_{44}, z_{44}, x_{45}, y_{45}, z_{45}, x_{46}, y_{46}, z_{46}, x_{47}, y_{47}, z_{47}, x_{48}, y_{48}, z_{48}, x_{49}, y_{49}, z_{49}, x_{50}, y_{50}, z_{50}, x_{51}, y_{51}, z_{51}, x_{52}, y_{52}, z_{52}, x_{53}, y_{53}, z_{53}, x_{54}, y_{54}, z_{54}, x_{55}, y_{55}, z_{55}, x_{56}, y_{56}, z_{56}, x_{57}, y_{57}, z_{57}, x_{58}, y_{58}, z_{58}, x_{59}, y_{59}, z_{59}, x_{60}, y_{60}, z_{60}, x_{61}, y_{61}, z_{61}, x_{62}, y_{62}, z_{62}$

- This data was taken at 100K. Above 285K the structure exhibits an incommensurate charge density wave, which is approximated by the high temperature Mo_8O_{23} structure.

Simple Monoclinic primitive vectors

$$\begin{aligned}
\mathbf{a_1} &= a\,\hat{\mathbf{x}} \\
\mathbf{a_2} &= b\,\hat{\mathbf{y}} \\
\mathbf{a_3} &= c\cos\beta\,\hat{\mathbf{x}} + c\sin\beta\,\hat{\mathbf{z}}
\end{aligned}$$



Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_1}$	=	$x_1\,\mathbf{a}_1 + y_1\,\mathbf{a}_2 + z_1\,\mathbf{a}_3$	=	$(ax_1 + cz_1\cos\beta)\,\hat{\mathbf{x}} + by_1\,\hat{\mathbf{y}} + cz_1\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo I
$\mathbf{B_2}$	=	$x_1\,\mathbf{a}_1 - y_1\,\mathbf{a}_2 + \left(z_1 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_1 + c\left(z_1 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_1\,\hat{\mathbf{y}} + c\left(z_1 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo I
$\mathbf{B_3}$	=	$x_2\,\mathbf{a}_1 + y_2\,\mathbf{a}_2 + z_2\,\mathbf{a}_3$	=	$(ax_2 + cz_2\cos\beta)\,\hat{\mathbf{x}} + by_2\,\hat{\mathbf{y}} + cz_2\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo II
$\mathbf{B_4}$	=	$x_2\,\mathbf{a}_1 - y_2\,\mathbf{a}_2 + \left(z_2 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_2 + c\left(z_2 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_2\,\hat{\mathbf{y}} + c\left(z_2 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo II
$\mathbf{B_5}$	=	$x_3\,\mathbf{a}_1 + y_3\,\mathbf{a}_2 + z_3\,\mathbf{a}_3$	=	$(ax_3 + cz_3\cos\beta)\,\hat{\mathbf{x}} + by_3\,\hat{\mathbf{y}} + cz_3\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo III
$\mathbf{B_6}$	=	$x_3\,\mathbf{a}_1 - y_3\,\mathbf{a}_2 + \left(z_3 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_3 + c\left(z_3 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_3\,\hat{\mathbf{y}} + c\left(z_3 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo III
$\mathbf{B_7}$	=	$x_4\,\mathbf{a}_1 + y_4\,\mathbf{a}_2 + z_4\,\mathbf{a}_3$	=	$(ax_4 + cz_4\cos\beta)\,\hat{\mathbf{x}} + by_4\,\hat{\mathbf{y}} + cz_4\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo IV
$\mathbf{B_8}$	=	$x_4\,\mathbf{a}_1 - y_4\,\mathbf{a}_2 + \left(z_4 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_4 + c\left(z_4 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_4\,\hat{\mathbf{y}} + c\left(z_4 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo IV
$\mathbf{B_9}$	=	$x_5\,\mathbf{a}_1 + y_5\,\mathbf{a}_2 + z_5\,\mathbf{a}_3$	=	$(ax_5 + cz_5\cos\beta)\,\hat{\mathbf{x}} + by_5\,\hat{\mathbf{y}} + cz_5\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo V
$\mathbf{B_{10}}$	=	$x_5\,\mathbf{a}_1 - y_5\,\mathbf{a}_2 + \left(z_5 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_5 + c\left(z_5 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_5\,\hat{\mathbf{y}} + c\left(z_5 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo V
$\mathbf{B_{11}}$	=	$x_6\,\mathbf{a}_1 + y_6\,\mathbf{a}_2 + z_6\,\mathbf{a}_3$	=	$(ax_6 + cz_6\cos\beta)\,\hat{\mathbf{x}} + by_6\,\hat{\mathbf{y}} + cz_6\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo VI
$\mathbf{B_{12}}$	=	$x_6\,\mathbf{a}_1 - y_6\,\mathbf{a}_2 + \left(z_6 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_6 + c\left(z_6 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_6\,\hat{\mathbf{y}} + c\left(z_6 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo VI
$\mathbf{B_{13}}$	=	$x_7\,\mathbf{a}_1 + y_7\,\mathbf{a}_2 + z_7\,\mathbf{a}_3$	=	$(ax_7 + cz_7\cos\beta)\,\hat{\mathbf{x}} + by_7\,\hat{\mathbf{y}} + cz_7\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo VII
$\mathbf{B_{14}}$	=	$x_7\,\mathbf{a}_1 - y_7\,\mathbf{a}_2 + \left(z_7 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_7 + c\left(z_7 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_7\,\hat{\mathbf{y}} + c\left(z_7 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo VII
$\mathbf{B_{15}}$	=	$x_8\,\mathbf{a}_1 + y_8\,\mathbf{a}_2 + z_8\,\mathbf{a}_3$	=	$(ax_8 + cz_8\cos\beta)\,\hat{\mathbf{x}} + by_8\,\hat{\mathbf{y}} + cz_8\sin\beta\,\hat{\mathbf{z}}$	(2a)	Mo VIII

$$\mathbf{B_{16}} = x_8\,\mathbf{a}_1 - y_8\,\mathbf{a}_2 + \left(z_8+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_8 + c\left(z_8+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_8\,\hat{\mathbf{y}} + c\left(z_8+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo VIII}$$

$$\mathbf{B_{17}} = x_9\,\mathbf{a}_1 + y_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3 = (ax_9 + cz_9\cos\beta)\,\hat{\mathbf{x}} + by_9\,\hat{\mathbf{y}} + cz_9\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo IX}$$

$$\mathbf{B_{18}} = x_9\,\mathbf{a}_1 - y_9\,\mathbf{a}_2 + \left(z_9+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_9 + c\left(z_9+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_9\,\hat{\mathbf{y}} + c\left(z_9+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo IX}$$

$$\mathbf{B_{19}} = x_{10}\,\mathbf{a}_1 + y_{10}\,\mathbf{a}_2 + z_{10}\,\mathbf{a}_3 = (ax_{10} + cz_{10}\cos\beta)\,\hat{\mathbf{x}} + by_{10}\,\hat{\mathbf{y}} + cz_{10}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo X}$$

$$\mathbf{B_{20}} = x_{10}\,\mathbf{a}_1 - y_{10}\,\mathbf{a}_2 + \left(z_{10}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{10} + c\left(z_{10}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{10}\,\hat{\mathbf{y}} + c\left(z_{10}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo X}$$

$$\mathbf{B_{21}} = x_{11}\,\mathbf{a}_1 + y_{11}\,\mathbf{a}_2 + z_{11}\,\mathbf{a}_3 = (ax_{11} + cz_{11}\cos\beta)\,\hat{\mathbf{x}} + by_{11}\,\hat{\mathbf{y}} + cz_{11}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XI}$$

$$\mathbf{B_{22}} = x_{11}\,\mathbf{a}_1 - y_{11}\,\mathbf{a}_2 + \left(z_{11}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{11} + c\left(z_{11}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{11}\,\hat{\mathbf{y}} + c\left(z_{11}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XI}$$

$$\mathbf{B_{23}} = x_{12}\,\mathbf{a}_1 + y_{12}\,\mathbf{a}_2 + z_{12}\,\mathbf{a}_3 = (ax_{12} + cz_{12}\cos\beta)\,\hat{\mathbf{x}} + by_{12}\,\hat{\mathbf{y}} + cz_{12}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XII}$$

$$\mathbf{B_{24}} = x_{12}\,\mathbf{a}_1 - y_{12}\,\mathbf{a}_2 + \left(z_{12}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{12} + c\left(z_{12}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{12}\,\hat{\mathbf{y}} + c\left(z_{12}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XII}$$

$$\mathbf{B_{25}} = x_{13}\,\mathbf{a}_1 + y_{13}\,\mathbf{a}_2 + z_{13}\,\mathbf{a}_3 = (ax_{13} + cz_{13}\cos\beta)\,\hat{\mathbf{x}} + by_{13}\,\hat{\mathbf{y}} + cz_{13}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XIII}$$

$$\mathbf{B_{26}} = x_{13}\,\mathbf{a}_1 - y_{13}\,\mathbf{a}_2 + \left(z_{13}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{13} + c\left(z_{13}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{13}\,\hat{\mathbf{y}} + c\left(z_{13}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XIII}$$

$$\mathbf{B_{27}} = x_{14}\,\mathbf{a}_1 + y_{14}\,\mathbf{a}_2 + z_{14}\,\mathbf{a}_3 = (ax_{14} + cz_{14}\cos\beta)\,\hat{\mathbf{x}} + by_{14}\,\hat{\mathbf{y}} + cz_{14}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XIV}$$

$$\mathbf{B_{28}} = x_{14}\,\mathbf{a}_1 - y_{14}\,\mathbf{a}_2 + \left(z_{14}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{14} + c\left(z_{14}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{14}\,\hat{\mathbf{y}} + c\left(z_{14}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XIV}$$

$$\mathbf{B_{29}} = x_{15}\,\mathbf{a}_1 + y_{15}\,\mathbf{a}_2 + z_{15}\,\mathbf{a}_3 = (ax_{15} + cz_{15}\cos\beta)\,\hat{\mathbf{x}} + by_{15}\,\hat{\mathbf{y}} + cz_{15}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XV}$$

$$\mathbf{B_{30}} = x_{15}\,\mathbf{a}_1 - y_{15}\,\mathbf{a}_2 + \left(z_{15}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{15} + c\left(z_{15}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{15}\,\hat{\mathbf{y}} + c\left(z_{15}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XV}$$

$$\mathbf{B_{31}} = x_{16}\,\mathbf{a}_1 + y_{16}\,\mathbf{a}_2 + z_{16}\,\mathbf{a}_3 = (ax_{16} + cz_{16}\cos\beta)\,\hat{\mathbf{x}} + by_{16}\,\hat{\mathbf{y}} + cz_{16}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XVI}$$

$$\mathbf{B_{32}} = x_{16}\,\mathbf{a}_1 - y_{16}\,\mathbf{a}_2 + \left(z_{16}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{16} + c\left(z_{16}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{16}\,\hat{\mathbf{y}} + c\left(z_{16}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{Mo XVI}$$

$$\mathbf{B_{33}} = x_{17}\,\mathbf{a}_1 + y_{17}\,\mathbf{a}_2 + z_{17}\,\mathbf{a}_3 = (ax_{17} + cz_{17}\cos\beta)\,\hat{\mathbf{x}} + by_{17}\,\hat{\mathbf{y}} + cz_{17}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O I}$$

$$\mathbf{B_{34}} = x_{17}\,\mathbf{a}_1 - y_{17}\,\mathbf{a}_2 + \left(z_{17}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{17} + c\left(z_{17}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{17}\,\hat{\mathbf{y}} + c\left(z_{17}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O I}$$

$$\mathbf{B_{35}} = x_{18}\,\mathbf{a}_1 + y_{18}\,\mathbf{a}_2 + z_{18}\,\mathbf{a}_3 = (ax_{18} + cz_{18}\cos\beta)\,\hat{\mathbf{x}} + by_{18}\,\hat{\mathbf{y}} + cz_{18}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O II}$$

$$\mathbf{B_{36}} = x_{18}\,\mathbf{a}_1 - y_{18}\,\mathbf{a}_2 + \left(z_{18}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{18} + c\left(z_{18}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{18}\,\hat{\mathbf{y}} + c\left(z_{18}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O II}$$

$$\mathbf{B_{37}} = x_{19}\,\mathbf{a}_1 + y_{19}\,\mathbf{a}_2 + z_{19}\,\mathbf{a}_3 = (ax_{19} + cz_{19}\cos\beta)\,\hat{\mathbf{x}} + by_{19}\,\hat{\mathbf{y}} + cz_{19}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O III}$$

$$\mathbf{B_{38}} = x_{19}\,\mathbf{a}_1 - y_{19}\,\mathbf{a}_2 + \left(z_{19}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{19} + c\left(z_{19}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{19}\,\hat{\mathbf{y}} + c\left(z_{19}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O III}$$

$$\mathbf{B_{39}} = x_{20}\,\mathbf{a}_1 + y_{20}\,\mathbf{a}_2 + z_{20}\,\mathbf{a}_3 = (ax_{20} + cz_{20}\cos\beta)\,\hat{\mathbf{x}} + by_{20}\,\hat{\mathbf{y}} + cz_{20}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O IV}$$

$$\mathbf{B_{40}} = x_{20}\,\mathbf{a}_1 - y_{20}\,\mathbf{a}_2 + \left(z_{20}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{20} + c\left(z_{20}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{20}\,\hat{\mathbf{y}} + c\left(z_{20}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O IV}$$

$$\mathbf{B_{41}} = x_{21}\,\mathbf{a}_1 + y_{21}\,\mathbf{a}_2 + z_{21}\,\mathbf{a}_3 = (ax_{21} + cz_{21}\cos\beta)\,\hat{\mathbf{x}} + by_{21}\,\hat{\mathbf{y}} + cz_{21}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O V}$$

$$\mathbf{B_{42}} = x_{21}\,\mathbf{a}_1 - y_{21}\,\mathbf{a}_2 + \left(z_{21}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{21} + c\left(z_{21}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{21}\,\hat{\mathbf{y}} + c\left(z_{21}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O V}$$

$$\mathbf{B_{43}} = x_{22}\,\mathbf{a}_1 + y_{22}\,\mathbf{a}_2 + z_{22}\,\mathbf{a}_3 = (ax_{22} + cz_{22}\cos\beta)\,\hat{\mathbf{x}} + by_{22}\,\hat{\mathbf{y}} + cz_{22}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O VI}$$

$$\mathbf{B_{44}} = x_{22}\,\mathbf{a}_1 - y_{22}\,\mathbf{a}_2 + \left(z_{22}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{22} + c\left(z_{22}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{22}\,\hat{\mathbf{y}} + c\left(z_{22}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O VI}$$

$$\mathbf{B_{45}} = x_{23}\,\mathbf{a}_1 + y_{23}\,\mathbf{a}_2 + z_{23}\,\mathbf{a}_3 = (ax_{23} + cz_{23}\cos\beta)\,\hat{\mathbf{x}} + by_{23}\,\hat{\mathbf{y}} + cz_{23}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O VII}$$

$$\mathbf{B_{46}} = x_{23}\,\mathbf{a}_1 - y_{23}\,\mathbf{a}_2 + \left(z_{23}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{23} + c\left(z_{23}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{23}\,\hat{\mathbf{y}} + c\left(z_{23}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O VII}$$

$$\mathbf{B_{47}} = x_{24}\,\mathbf{a}_1 + y_{24}\,\mathbf{a}_2 + z_{24}\,\mathbf{a}_3 = (ax_{24} + cz_{24}\cos\beta)\,\hat{\mathbf{x}} + by_{24}\,\hat{\mathbf{y}} + cz_{24}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O VIII}$$

$$\mathbf{B_{48}} = x_{24}\,\mathbf{a}_1 - y_{24}\,\mathbf{a}_2 + \left(z_{24}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{24} + c\left(z_{24}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{24}\,\hat{\mathbf{y}} + c\left(z_{24}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O VIII}$$

$$\mathbf{B_{49}} = x_{25}\,\mathbf{a}_1 + y_{25}\,\mathbf{a}_2 + z_{25}\,\mathbf{a}_3 = (ax_{25} + cz_{25}\cos\beta)\,\hat{\mathbf{x}} + by_{25}\,\hat{\mathbf{y}} + cz_{25}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O IX}$$

$$\mathbf{B_{50}} = x_{25}\,\mathbf{a}_1 - y_{25}\,\mathbf{a}_2 + \left(z_{25}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{25} + c\left(z_{25}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{25}\,\hat{\mathbf{y}} + c\left(z_{25}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O IX}$$

$$\mathbf{B_{51}} = x_{26}\,\mathbf{a}_1 + y_{26}\,\mathbf{a}_2 + z_{26}\,\mathbf{a}_3 = (ax_{26} + cz_{26}\cos\beta)\,\hat{\mathbf{x}} + by_{26}\,\hat{\mathbf{y}} + cz_{26}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O X}$$

$$\mathbf{B_{52}} = x_{26}\,\mathbf{a}_1 - y_{26}\,\mathbf{a}_2 + \left(z_{26}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{26} + c\left(z_{26}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{26}\,\hat{\mathbf{y}} + c\left(z_{26}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O X}$$

$$\mathbf{B_{53}} = x_{27}\,\mathbf{a}_1 + y_{27}\,\mathbf{a}_2 + z_{27}\,\mathbf{a}_3 = (ax_{27} + cz_{27}\cos\beta)\,\hat{\mathbf{x}} + by_{27}\,\hat{\mathbf{y}} + cz_{27}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XI}$$

$$\mathbf{B_{54}} = x_{27}\,\mathbf{a}_1 - y_{27}\,\mathbf{a}_2 + \left(z_{27}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{27} + c\left(z_{27}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{27}\,\hat{\mathbf{y}} + c\left(z_{27}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XI}$$

$$\mathbf{B_{55}} = x_{28}\,\mathbf{a}_1 + y_{28}\,\mathbf{a}_2 + z_{28}\,\mathbf{a}_3 = (ax_{28} + cz_{28}\cos\beta)\,\hat{\mathbf{x}} + by_{28}\,\hat{\mathbf{y}} + cz_{28}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XII}$$

$$\mathbf{B_{56}} = x_{28}\,\mathbf{a}_1 - y_{28}\,\mathbf{a}_2 + \left(z_{28}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{28} + c\left(z_{28}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{28}\,\hat{\mathbf{y}} + c\left(z_{28}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XII}$$

$$\mathbf{B_{57}} = x_{29}\,\mathbf{a}_1 + y_{29}\,\mathbf{a}_2 + z_{29}\,\mathbf{a}_3 = (ax_{29} + cz_{29}\cos\beta)\,\hat{\mathbf{x}} + by_{29}\,\hat{\mathbf{y}} + cz_{29}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XIII}$$

$$\mathbf{B_{58}} = x_{29}\,\mathbf{a}_1 - y_{29}\,\mathbf{a}_2 + \left(z_{29}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{29} + c\left(z_{29}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{29}\,\hat{\mathbf{y}} + c\left(z_{29}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XIII}$$

$$\mathbf{B_{59}} = x_{30}\,\mathbf{a}_1 + y_{30}\,\mathbf{a}_2 + z_{30}\,\mathbf{a}_3 = (ax_{30} + cz_{30}\cos\beta)\,\hat{\mathbf{x}} + by_{30}\,\hat{\mathbf{y}} + cz_{30}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XIV}$$

$$\mathbf{B_{60}} = x_{30}\,\mathbf{a}_1 - y_{30}\,\mathbf{a}_2 + \left(z_{30}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{30} + c\left(z_{30}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{30}\,\hat{\mathbf{y}} + c\left(z_{30}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XIV}$$

$$\mathbf{B_{61}} = x_{31}\,\mathbf{a}_1 + y_{31}\,\mathbf{a}_2 + z_{31}\,\mathbf{a}_3 = (ax_{31} + cz_{31}\cos\beta)\,\hat{\mathbf{x}} + by_{31}\,\hat{\mathbf{y}} + cz_{31}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XV}$$

$$\mathbf{B_{62}} = x_{31}\,\mathbf{a}_1 - y_{31}\,\mathbf{a}_2 + \left(z_{31}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{31} + c\left(z_{31}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{31}\,\hat{\mathbf{y}} + c\left(z_{31}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XV}$$

$$\mathbf{B_{63}} = x_{32}\,\mathbf{a}_1 + y_{32}\,\mathbf{a}_2 + z_{32}\,\mathbf{a}_3 = (ax_{32} + cz_{32}\cos\beta)\,\hat{\mathbf{x}} + by_{32}\,\hat{\mathbf{y}} + cz_{32}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XVI}$$

$$\mathbf{B_{64}} = x_{32}\,\mathbf{a}_1 - y_{32}\,\mathbf{a}_2 + \left(z_{32}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{32} + c\left(z_{32}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{32}\,\hat{\mathbf{y}} + c\left(z_{32}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XVI}$$

$$\mathbf{B_{65}} = x_{33}\,\mathbf{a}_1 + y_{33}\,\mathbf{a}_2 + z_{33}\,\mathbf{a}_3 = (ax_{33} + cz_{33}\cos\beta)\,\hat{\mathbf{x}} + by_{33}\,\hat{\mathbf{y}} + cz_{33}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XVII}$$

$$\mathbf{B_{66}} = x_{33}\,\mathbf{a}_1 - y_{33}\,\mathbf{a}_2 + \left(z_{33}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{33} + c\left(z_{33}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{33}\,\hat{\mathbf{y}} + c\left(z_{33}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XVII}$$

$$\mathbf{B_{67}} = x_{34}\,\mathbf{a}_1 + y_{34}\,\mathbf{a}_2 + z_{34}\,\mathbf{a}_3 = (ax_{34} + cz_{34}\cos\beta)\,\hat{\mathbf{x}} + by_{34}\,\hat{\mathbf{y}} + cz_{34}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XVIII}$$

$$\mathbf{B_{68}} = x_{34}\,\mathbf{a}_1 - y_{34}\,\mathbf{a}_2 + \left(z_{34}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{34} + c\left(z_{34}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{34}\,\hat{\mathbf{y}} + c\left(z_{34}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XVIII}$$

$$\mathbf{B_{69}} = x_{35}\,\mathbf{a}_1 + y_{35}\,\mathbf{a}_2 + z_{35}\,\mathbf{a}_3 = (ax_{35} + cz_{35}\cos\beta)\,\hat{\mathbf{x}} + by_{35}\,\hat{\mathbf{y}} + cz_{35}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XIX}$$

$$\mathbf{B_{70}} = x_{35}\,\mathbf{a}_1 - y_{35}\,\mathbf{a}_2 + \left(z_{35}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{35} + c\left(z_{35}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{35}\,\hat{\mathbf{y}} + c\left(z_{35}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XIX}$$

$$\mathbf{B_{71}} = x_{36}\,\mathbf{a}_1 + y_{36}\,\mathbf{a}_2 + z_{36}\,\mathbf{a}_3 = (ax_{36} + cz_{36}\cos\beta)\,\hat{\mathbf{x}} + by_{36}\,\hat{\mathbf{y}} + cz_{36}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XX}$$

$$\mathbf{B_{72}} = x_{36}\,\mathbf{a}_1 - y_{36}\,\mathbf{a}_2 + \left(z_{36}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{36} + c\left(z_{36}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{36}\,\hat{\mathbf{y}} + c\left(z_{36}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XX}$$

$$\mathbf{B_{73}} = x_{37}\,\mathbf{a}_1 + y_{37}\,\mathbf{a}_2 + z_{37}\,\mathbf{a}_3 = (ax_{37} + cz_{37}\cos\beta)\,\hat{\mathbf{x}} + by_{37}\,\hat{\mathbf{y}} + cz_{37}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XXI}$$

$$\mathbf{B_{74}} = x_{37}\,\mathbf{a}_1 - y_{37}\,\mathbf{a}_2 + \left(z_{37}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{37} + c\left(z_{37}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{37}\,\hat{\mathbf{y}} + c\left(z_{37}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XXI}$$

$$\mathbf{B_{75}} = x_{38}\,\mathbf{a}_1 + y_{38}\,\mathbf{a}_2 + z_{38}\,\mathbf{a}_3 = (ax_{38} + cz_{38}\cos\beta)\,\hat{\mathbf{x}} + by_{38}\,\hat{\mathbf{y}} + cz_{38}\sin\beta\,\hat{\mathbf{z}} \quad (2a) \quad \text{O XXII}$$

$\mathbf{B_{76}} = x_{38}\,\mathbf{a}_1 - y_{38}\,\mathbf{a}_2 + \left(z_{38}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{38} + c\left(z_{38}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{38}\,\hat{\mathbf{y}} + c\left(z_{38}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXII

$\mathbf{B_{77}} = x_{39}\,\mathbf{a}_1 + y_{39}\,\mathbf{a}_2 + z_{39}\,\mathbf{a}_3 = (ax_{39} + cz_{39}\cos\beta)\,\hat{\mathbf{x}} + by_{39}\,\hat{\mathbf{y}} + cz_{39}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXIII

$\mathbf{B_{78}} = x_{39}\,\mathbf{a}_1 - y_{39}\,\mathbf{a}_2 + \left(z_{39}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{39} + c\left(z_{39}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{39}\,\hat{\mathbf{y}} + c\left(z_{39}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXIII

$\mathbf{B_{79}} = x_{40}\,\mathbf{a}_1 + y_{40}\,\mathbf{a}_2 + z_{40}\,\mathbf{a}_3 = (ax_{40} + cz_{40}\cos\beta)\,\hat{\mathbf{x}} + by_{40}\,\hat{\mathbf{y}} + cz_{40}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXIV

$\mathbf{B_{80}} = x_{40}\,\mathbf{a}_1 - y_{40}\,\mathbf{a}_2 + \left(z_{40}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{40} + c\left(z_{40}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{40}\,\hat{\mathbf{y}} + c\left(z_{40}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXIV

$\mathbf{B_{81}} = x_{41}\,\mathbf{a}_1 + y_{41}\,\mathbf{a}_2 + z_{41}\,\mathbf{a}_3 = (ax_{41} + cz_{41}\cos\beta)\,\hat{\mathbf{x}} + by_{41}\,\hat{\mathbf{y}} + cz_{41}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXV

$\mathbf{B_{82}} = x_{41}\,\mathbf{a}_1 - y_{41}\,\mathbf{a}_2 + \left(z_{41}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{41} + c\left(z_{41}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{41}\,\hat{\mathbf{y}} + c\left(z_{41}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXV

$\mathbf{B_{83}} = x_{42}\,\mathbf{a}_1 + y_{42}\,\mathbf{a}_2 + z_{42}\,\mathbf{a}_3 = (ax_{42} + cz_{42}\cos\beta)\,\hat{\mathbf{x}} + by_{42}\,\hat{\mathbf{y}} + cz_{42}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXVI

$\mathbf{B_{84}} = x_{42}\,\mathbf{a}_1 - y_{42}\,\mathbf{a}_2 + \left(z_{42}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{42} + c\left(z_{42}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{42}\,\hat{\mathbf{y}} + c\left(z_{42}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXVI

$\mathbf{B_{85}} = x_{43}\,\mathbf{a}_1 + y_{43}\,\mathbf{a}_2 + z_{43}\,\mathbf{a}_3 = (ax_{43} + cz_{43}\cos\beta)\,\hat{\mathbf{x}} + by_{43}\,\hat{\mathbf{y}} + cz_{43}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXVII

$\mathbf{B_{86}} = x_{43}\,\mathbf{a}_1 - y_{43}\,\mathbf{a}_2 + \left(z_{43}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{43} + c\left(z_{43}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{43}\,\hat{\mathbf{y}} + c\left(z_{43}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXVII

$\mathbf{B_{87}} = x_{44}\,\mathbf{a}_1 + y_{44}\,\mathbf{a}_2 + z_{44}\,\mathbf{a}_3 = (ax_{44} + cz_{44}\cos\beta)\,\hat{\mathbf{x}} + by_{44}\,\hat{\mathbf{y}} + cz_{44}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXVIII

$\mathbf{B_{88}} = x_{44}\,\mathbf{a}_1 - y_{44}\,\mathbf{a}_2 + \left(z_{44}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{44} + c\left(z_{44}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{44}\,\hat{\mathbf{y}} + c\left(z_{44}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXVIII

$\mathbf{B_{89}} = x_{45}\,\mathbf{a}_1 + y_{45}\,\mathbf{a}_2 + z_{45}\,\mathbf{a}_3 = (ax_{45} + cz_{45}\cos\beta)\,\hat{\mathbf{x}} + by_{45}\,\hat{\mathbf{y}} + cz_{45}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXIX

$\mathbf{B_{90}} = x_{45}\,\mathbf{a}_1 - y_{45}\,\mathbf{a}_2 + \left(z_{45}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{45} + c\left(z_{45}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{45}\,\hat{\mathbf{y}} + c\left(z_{45}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXIX

$\mathbf{B_{91}} = x_{46}\,\mathbf{a}_1 + y_{46}\,\mathbf{a}_2 + z_{46}\,\mathbf{a}_3 = (ax_{46} + cz_{46}\cos\beta)\,\hat{\mathbf{x}} + by_{46}\,\hat{\mathbf{y}} + cz_{46}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXX

$\mathbf{B_{92}} = x_{46}\,\mathbf{a}_1 - y_{46}\,\mathbf{a}_2 + \left(z_{46}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{46} + c\left(z_{46}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{46}\,\hat{\mathbf{y}} + c\left(z_{46}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXX

$\mathbf{B_{93}} = x_{47}\,\mathbf{a}_1 + y_{47}\,\mathbf{a}_2 + z_{47}\,\mathbf{a}_3 = (ax_{47} + cz_{47}\cos\beta)\,\hat{\mathbf{x}} + by_{47}\,\hat{\mathbf{y}} + cz_{47}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXXI

$\mathbf{B_{94}} = x_{47}\,\mathbf{a}_1 - y_{47}\,\mathbf{a}_2 + \left(z_{47}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{47} + c\left(z_{47}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{47}\,\hat{\mathbf{y}} + c\left(z_{47}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXXI

$\mathbf{B_{95}} = x_{48}\,\mathbf{a}_1 + y_{48}\,\mathbf{a}_2 + z_{48}\,\mathbf{a}_3 = (ax_{48} + cz_{48}\cos\beta)\,\hat{\mathbf{x}} + by_{48}\,\hat{\mathbf{y}} + cz_{48}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXXII

$\mathbf{B_{96}} = x_{48}\,\mathbf{a}_1 - y_{48}\,\mathbf{a}_2 + \left(z_{48}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{48} + c\left(z_{48}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{48}\,\hat{\mathbf{y}} + c\left(z_{48}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXXII

$\mathbf{B_{97}} = x_{49}\,\mathbf{a}_1 + y_{49}\,\mathbf{a}_2 + z_{49}\,\mathbf{a}_3 = (ax_{49} + cz_{49}\cos\beta)\,\hat{\mathbf{x}} + by_{49}\,\hat{\mathbf{y}} + cz_{49}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXXIII

$\mathbf{B_{98}} = x_{49}\,\mathbf{a}_1 - y_{49}\,\mathbf{a}_2 + \left(z_{49}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{49} + c\left(z_{49}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{49}\,\hat{\mathbf{y}} + c\left(z_{49}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXXIII

$\mathbf{B_{99}} = x_{50}\,\mathbf{a}_1 + y_{50}\,\mathbf{a}_2 + z_{50}\,\mathbf{a}_3 = (ax_{50} + cz_{50}\cos\beta)\,\hat{\mathbf{x}} + by_{50}\,\hat{\mathbf{y}} + cz_{50}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXXIV

$\mathbf{B_{100}} = x_{50}\,\mathbf{a}_1 - y_{50}\,\mathbf{a}_2 + \left(z_{50}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{50} + c\left(z_{50}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{50}\,\hat{\mathbf{y}} + c\left(z_{50}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXXIV

$\mathbf{B_{101}} = x_{51}\,\mathbf{a}_1 + y_{51}\,\mathbf{a}_2 + z_{51}\,\mathbf{a}_3 = (ax_{51} + cz_{51}\cos\beta)\,\hat{\mathbf{x}} + by_{51}\,\hat{\mathbf{y}} + cz_{51}\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXXV

$\mathbf{B_{102}} = x_{51}\,\mathbf{a}_1 - y_{51}\,\mathbf{a}_2 + \left(z_{51}+\frac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{51} + c\left(z_{51}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{51}\,\hat{\mathbf{y}} + c\left(z_{51}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$ (2a) O XXXV

$$\mathbf{B_{103}} = x_{52}\,\mathbf{a}_1 + y_{52}\,\mathbf{a}_2 + z_{52}\,\mathbf{a}_3 = (ax_{52} + cz_{52}\cos\beta)\,\hat{\mathbf{x}} + by_{52}\,\hat{\mathbf{y}} + cz_{52}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XXXVI}$$

$$\mathbf{B_{104}} = x_{52}\,\mathbf{a}_1 - y_{52}\,\mathbf{a}_2 + \left(z_{52}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{52} + c\left(z_{52}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{52}\,\hat{\mathbf{y}} + c\left(z_{52}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XXXVI}$$

$$\mathbf{B_{105}} = x_{53}\,\mathbf{a}_1 + y_{53}\,\mathbf{a}_2 + z_{53}\,\mathbf{a}_3 = (ax_{53} + cz_{53}\cos\beta)\,\hat{\mathbf{x}} + by_{53}\,\hat{\mathbf{y}} + cz_{53}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XXXVII}$$

$$\mathbf{B_{106}} = x_{53}\,\mathbf{a}_1 - y_{53}\,\mathbf{a}_2 + \left(z_{53}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{53} + c\left(z_{53}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{53}\,\hat{\mathbf{y}} + c\left(z_{53}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XXXVII}$$

$$\mathbf{B_{107}} = x_{54}\,\mathbf{a}_1 + y_{54}\,\mathbf{a}_2 + z_{54}\,\mathbf{a}_3 = (ax_{54} + cz_{54}\cos\beta)\,\hat{\mathbf{x}} + by_{54}\,\hat{\mathbf{y}} + cz_{54}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XXXVIII}$$

$$\mathbf{B_{108}} = x_{54}\,\mathbf{a}_1 - y_{54}\,\mathbf{a}_2 + \left(z_{54}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{54} + c\left(z_{54}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{54}\,\hat{\mathbf{y}} + c\left(z_{54}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XXXVIII}$$

$$\mathbf{B_{109}} = x_{55}\,\mathbf{a}_1 + y_{55}\,\mathbf{a}_2 + z_{55}\,\mathbf{a}_3 = (ax_{55} + cz_{55}\cos\beta)\,\hat{\mathbf{x}} + by_{55}\,\hat{\mathbf{y}} + cz_{55}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XXXIX}$$

$$\mathbf{B_{110}} = x_{55}\,\mathbf{a}_1 - y_{55}\,\mathbf{a}_2 + \left(z_{55}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{55} + c\left(z_{55}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{55}\,\hat{\mathbf{y}} + c\left(z_{55}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XXXIX}$$

$$\mathbf{B_{111}} = x_{56}\,\mathbf{a}_1 + y_{56}\,\mathbf{a}_2 + z_{56}\,\mathbf{a}_3 = (ax_{56} + cz_{56}\cos\beta)\,\hat{\mathbf{x}} + by_{56}\,\hat{\mathbf{y}} + cz_{56}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XL}$$

$$\mathbf{B_{112}} = x_{56}\,\mathbf{a}_1 - y_{56}\,\mathbf{a}_2 + \left(z_{56}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{56} + c\left(z_{56}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{56}\,\hat{\mathbf{y}} + c\left(z_{56}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XL}$$

$$\mathbf{B_{113}} = x_{57}\,\mathbf{a}_1 + y_{57}\,\mathbf{a}_2 + z_{57}\,\mathbf{a}_3 = (ax_{57} + cz_{57}\cos\beta)\,\hat{\mathbf{x}} + by_{57}\,\hat{\mathbf{y}} + cz_{57}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLI}$$

$$\mathbf{B_{114}} = x_{57}\,\mathbf{a}_1 - y_{57}\,\mathbf{a}_2 + \left(z_{57}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{57} + c\left(z_{57}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{57}\,\hat{\mathbf{y}} + c\left(z_{57}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLI}$$

$$\mathbf{B_{115}} = x_{58}\,\mathbf{a}_1 + y_{58}\,\mathbf{a}_2 + z_{58}\,\mathbf{a}_3 = (ax_{58} + cz_{58}\cos\beta)\,\hat{\mathbf{x}} + by_{58}\,\hat{\mathbf{y}} + cz_{58}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLII}$$

$$\mathbf{B_{116}} = x_{58}\,\mathbf{a}_1 - y_{58}\,\mathbf{a}_2 + \left(z_{58}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{58} + c\left(z_{58}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{58}\,\hat{\mathbf{y}} + c\left(z_{58}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLII}$$

$$\mathbf{B_{117}} = x_{59}\,\mathbf{a}_1 + y_{59}\,\mathbf{a}_2 + z_{59}\,\mathbf{a}_3 = (ax_{59} + cz_{59}\cos\beta)\,\hat{\mathbf{x}} + by_{59}\,\hat{\mathbf{y}} + cz_{59}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLIII}$$

$$\mathbf{B_{118}} = x_{59}\,\mathbf{a}_1 - y_{59}\,\mathbf{a}_2 + \left(z_{59}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{59} + c\left(z_{59}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{59}\,\hat{\mathbf{y}} + c\left(z_{59}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLIII}$$

$$\mathbf{B_{119}} = x_{60}\,\mathbf{a}_1 + y_{60}\,\mathbf{a}_2 + z_{60}\,\mathbf{a}_3 = (ax_{60} + cz_{60}\cos\beta)\,\hat{\mathbf{x}} + by_{60}\,\hat{\mathbf{y}} + cz_{60}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLIV}$$

$$\mathbf{B_{120}} = x_{60}\,\mathbf{a}_1 - y_{60}\,\mathbf{a}_2 + \left(z_{60}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{60} + c\left(z_{60}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{60}\,\hat{\mathbf{y}} + c\left(z_{60}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLIV}$$

$$\mathbf{B_{121}} = x_{61}\,\mathbf{a}_1 + y_{61}\,\mathbf{a}_2 + z_{61}\,\mathbf{a}_3 = (ax_{61} + cz_{61}\cos\beta)\,\hat{\mathbf{x}} + by_{61}\,\hat{\mathbf{y}} + cz_{61}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLV}$$

$$\mathbf{B_{122}} = x_{61}\,\mathbf{a}_1 - y_{61}\,\mathbf{a}_2 + \left(z_{61}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{61} + c\left(z_{61}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{61}\,\hat{\mathbf{y}} + c\left(z_{61}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLV}$$

$$\mathbf{B_{123}} = x_{62}\,\mathbf{a}_1 + y_{62}\,\mathbf{a}_2 + z_{62}\,\mathbf{a}_3 = (ax_{62} + cz_{62}\cos\beta)\,\hat{\mathbf{x}} + by_{62}\,\hat{\mathbf{y}} + cz_{62}\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLVI}$$

$$\mathbf{B_{124}} = x_{62}\,\mathbf{a}_1 - y_{62}\,\mathbf{a}_2 + \left(z_{62}+\tfrac{1}{2}\right)\,\mathbf{a}_3 = \left(ax_{62} + c\left(z_{62}+\tfrac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{62}\,\hat{\mathbf{y}} + c\left(z_{62}+\tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \quad \text{(2a)} \quad \text{O XLVI}$$

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