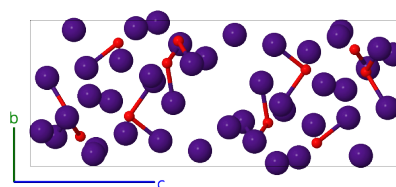# Cs$_{11}$O$_3$ Structure: A11B3_mP56_14_11e_3e-001
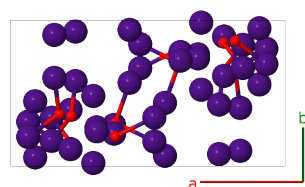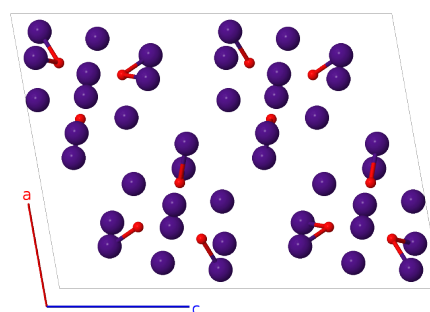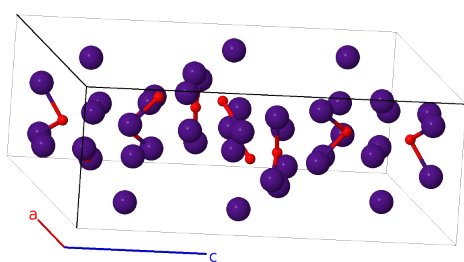
This structure originally had the label `A11B3_mP56_14_11e_3e`. Calls to that address will be redirected here.

https://aflow.org/p/2343

https://aflow.org/p/A11B3_mP56_14_11e_3e-001

Prototype	Cs$_{11}$O$_3$
AFLOW prototype label	A11B3_mP56_14_11e_3e-001
ICSD	1077
Pearson symbol	mP56
Space group number	14

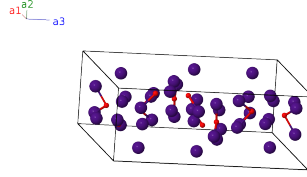|						
Space group symbol		$P2_1/c$				

AFLOW prototype command   `aflow --proto=A11B3_mP56_14_11e_3e-001`
`--params=`$a, b/a, c/a, \beta, x_1, y_1, z_1, x_2, y_2, z_2, x_3, y_3, z_3, x_4, y_4, z_4, x_5, y_5, z_5, x_6, y_6, z_6, x_7,$
$y_7, z_7, x_8, y_8, z_8, x_9, y_9, z_9, x_{10}, y_{10}, z_{10}, x_{11}, y_{11}, z_{11}, x_{12}, y_{12}, z_{12}, x_{13}, y_{13}, z_{13}, x_{14}, y_{14}, z_{14}$

Simple Monoclinic primitive vectors

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

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)	Cs I
$\mathbf{B_2}$	$=$	$-x_1\,\mathbf{a_1} + \left(y_1 + \frac{1}{2}\right)\mathbf{a_2} - \left(z_1 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$-\left(ax_1 + c\left(z_1 - \frac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + b\left(y_1 + \frac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_1 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4e)	Cs 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)	Cs I
$\mathbf{B_4}$	$=$	$x_1\,\mathbf{a_1} - \left(y_1 - \frac{1}{2}\right)\mathbf{a_2} + \left(z_1 + \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\left(ax_1 + c\left(z_1 + \frac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - b\left(y_1 - \frac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_1 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4e)	Cs 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)	Cs II
$\mathbf{B_6}$	$=$	$-x_2\,\mathbf{a_1} + \left(y_2 + \frac{1}{2}\right)\mathbf{a_2} - \left(z_2 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$-\left(ax_2 + c\left(z_2 - \frac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + b\left(y_2 + \frac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_2 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4e)	Cs 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)	Cs II
$\mathbf{B_8}$	$=$	$x_2\,\mathbf{a_1} - \left(y_2 - \frac{1}{2}\right)\mathbf{a_2} + \left(z_2 + \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\left(ax_2 + c\left(z_2 + \frac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - b\left(y_2 - \frac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_2 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4e)	Cs 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)	Cs III
$\mathbf{B_{10}}$	$=$	$-x_3\,\mathbf{a_1} + \left(y_3 + \frac{1}{2}\right)\mathbf{a_2} - \left(z_3 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$-\left(ax_3 + c\left(z_3 - \frac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + b\left(y_3 + \frac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_3 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4e)	Cs 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)	Cs III
$\mathbf{B_{12}}$	$=$	$x_3\,\mathbf{a_1} - \left(y_3 - \frac{1}{2}\right)\mathbf{a_2} + \left(z_3 + \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\left(ax_3 + c\left(z_3 + \frac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - b\left(y_3 - \frac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_3 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4e)	Cs 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)	Cs IV
$\mathbf{B_{14}}$	$=$	$-x_4\,\mathbf{a_1} + \left(y_4 + \frac{1}{2}\right)\mathbf{a_2} - \left(z_4 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$-\left(ax_4 + c\left(z_4 - \frac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + b\left(y_4 + \frac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_4 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4e)	Cs 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)	Cs IV
$\mathbf{B_{16}}$	$=$	$x_4\,\mathbf{a_1} - \left(y_4 - \frac{1}{2}\right)\mathbf{a_2} + \left(z_4 + \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\left(ax_4 + c\left(z_4 + \frac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - b\left(y_4 - \frac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_4 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4e)	Cs 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)	Cs V
$\mathbf{B_{18}}$	$=$	$-x_5\,\mathbf{a_1} + \left(y_5 + \frac{1}{2}\right)\mathbf{a_2} - \left(z_5 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$-\left(ax_5 + c\left(z_5 - \frac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + b\left(y_5 + \frac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_5 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4e)	Cs 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)	Cs V

$$\mathbf{B_{20}} = x_5\,\mathbf{a}_1 - \left(y_5 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_5 + \tfrac{1}{2}\right)\mathbf{a}_3 = \begin{array}{l}\left(ax_5 + c\left(z_5 + \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - \\ b\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_5 + \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs V}$$

$$\mathbf{B_{21}} = x_6\,\mathbf{a}_1 + y_6\,\mathbf{a}_2 + z_6\,\mathbf{a}_3 = \left(ax_6 + cz_6\cos\beta\right)\hat{\mathbf{x}} + by_6\,\hat{\mathbf{y}} + cz_6\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{Cs VI}$$

$$\mathbf{B_{22}} = \begin{array}{c}-x_6\,\mathbf{a}_1 + \left(y_6 + \tfrac{1}{2}\right)\mathbf{a}_2 - \\ \left(z_6 - \tfrac{1}{2}\right)\mathbf{a}_3\end{array} = \begin{array}{l}-\left(ax_6 + c\left(z_6 - \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + \\ b\left(y_6 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_6 - \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs VI}$$

$$\mathbf{B_{23}} = -x_6\,\mathbf{a}_1 - y_6\,\mathbf{a}_2 - z_6\,\mathbf{a}_3 = -\left(ax_6 + cz_6\cos\beta\right)\hat{\mathbf{x}} - by_6\,\hat{\mathbf{y}} - cz_6\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{Cs VI}$$

$$\mathbf{B_{24}} = x_6\,\mathbf{a}_1 - \left(y_6 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_6 + \tfrac{1}{2}\right)\mathbf{a}_3 = \begin{array}{l}\left(ax_6 + c\left(z_6 + \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - \\ b\left(y_6 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_6 + \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs VI}$$

$$\mathbf{B_{25}} = x_7\,\mathbf{a}_1 + y_7\,\mathbf{a}_2 + z_7\,\mathbf{a}_3 = \left(ax_7 + cz_7\cos\beta\right)\hat{\mathbf{x}} + by_7\,\hat{\mathbf{y}} + cz_7\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{Cs VII}$$

$$\mathbf{B_{26}} = \begin{array}{c}-x_7\,\mathbf{a}_1 + \left(y_7 + \tfrac{1}{2}\right)\mathbf{a}_2 - \\ \left(z_7 - \tfrac{1}{2}\right)\mathbf{a}_3\end{array} = \begin{array}{l}-\left(ax_7 + c\left(z_7 - \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + \\ b\left(y_7 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_7 - \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs VII}$$

$$\mathbf{B_{27}} = -x_7\,\mathbf{a}_1 - y_7\,\mathbf{a}_2 - z_7\,\mathbf{a}_3 = -\left(ax_7 + cz_7\cos\beta\right)\hat{\mathbf{x}} - by_7\,\hat{\mathbf{y}} - cz_7\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{Cs VII}$$

$$\mathbf{B_{28}} = x_7\,\mathbf{a}_1 - \left(y_7 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_7 + \tfrac{1}{2}\right)\mathbf{a}_3 = \begin{array}{l}\left(ax_7 + c\left(z_7 + \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - \\ b\left(y_7 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_7 + \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs VII}$$

$$\mathbf{B_{29}} = x_8\,\mathbf{a}_1 + y_8\,\mathbf{a}_2 + z_8\,\mathbf{a}_3 = \left(ax_8 + cz_8\cos\beta\right)\hat{\mathbf{x}} + by_8\,\hat{\mathbf{y}} + cz_8\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{Cs VIII}$$

$$\mathbf{B_{30}} = \begin{array}{c}-x_8\,\mathbf{a}_1 + \left(y_8 + \tfrac{1}{2}\right)\mathbf{a}_2 - \\ \left(z_8 - \tfrac{1}{2}\right)\mathbf{a}_3\end{array} = \begin{array}{l}-\left(ax_8 + c\left(z_8 - \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + \\ b\left(y_8 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_8 - \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs VIII}$$

$$\mathbf{B_{31}} = -x_8\,\mathbf{a}_1 - y_8\,\mathbf{a}_2 - z_8\,\mathbf{a}_3 = -\left(ax_8 + cz_8\cos\beta\right)\hat{\mathbf{x}} - by_8\,\hat{\mathbf{y}} - cz_8\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{Cs VIII}$$

$$\mathbf{B_{32}} = x_8\,\mathbf{a}_1 - \left(y_8 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_8 + \tfrac{1}{2}\right)\mathbf{a}_3 = \begin{array}{l}\left(ax_8 + c\left(z_8 + \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - \\ b\left(y_8 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_8 + \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs VIII}$$

$$\mathbf{B_{33}} = x_9\,\mathbf{a}_1 + y_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3 = \left(ax_9 + cz_9\cos\beta\right)\hat{\mathbf{x}} + by_9\,\hat{\mathbf{y}} + cz_9\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{Cs IX}$$

$$\mathbf{B_{34}} = \begin{array}{c}-x_9\,\mathbf{a}_1 + \left(y_9 + \tfrac{1}{2}\right)\mathbf{a}_2 - \\ \left(z_9 - \tfrac{1}{2}\right)\mathbf{a}_3\end{array} = \begin{array}{l}-\left(ax_9 + c\left(z_9 - \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + \\ b\left(y_9 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_9 - \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs IX}$$

$$\mathbf{B_{35}} = -x_9\,\mathbf{a}_1 - y_9\,\mathbf{a}_2 - z_9\,\mathbf{a}_3 = -\left(ax_9 + cz_9\cos\beta\right)\hat{\mathbf{x}} - by_9\,\hat{\mathbf{y}} - cz_9\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{Cs IX}$$

$$\mathbf{B_{36}} = x_9\,\mathbf{a}_1 - \left(y_9 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_9 + \tfrac{1}{2}\right)\mathbf{a}_3 = \begin{array}{l}\left(ax_9 + c\left(z_9 + \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - \\ b\left(y_9 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_9 + \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs IX}$$

$$\mathbf{B_{37}} = x_{10}\,\mathbf{a}_1 + y_{10}\,\mathbf{a}_2 + z_{10}\,\mathbf{a}_3 = \left(ax_{10} + cz_{10}\cos\beta\right)\hat{\mathbf{x}} + by_{10}\,\hat{\mathbf{y}} + cz_{10}\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{Cs X}$$

$$\mathbf{B_{38}} = \begin{array}{c}-x_{10}\,\mathbf{a}_1 + \left(y_{10} + \tfrac{1}{2}\right)\mathbf{a}_2 - \\ \left(z_{10} - \tfrac{1}{2}\right)\mathbf{a}_3\end{array} = \begin{array}{l}-\left(ax_{10} + c\left(z_{10} - \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + \\ b\left(y_{10} + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_{10} - \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs X}$$

$$\mathbf{B_{39}} = -x_{10}\,\mathbf{a}_1 - y_{10}\,\mathbf{a}_2 - z_{10}\,\mathbf{a}_3 = \begin{array}{l}-\left(ax_{10} + cz_{10}\cos\beta\right)\hat{\mathbf{x}} - by_{10}\,\hat{\mathbf{y}} - \\ cz_{10}\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs X}$$

$$\mathbf{B_{40}} = \begin{array}{c}x_{10}\,\mathbf{a}_1 - \left(y_{10} - \tfrac{1}{2}\right)\mathbf{a}_2 + \\ \left(z_{10} + \tfrac{1}{2}\right)\mathbf{a}_3\end{array} = \begin{array}{l}\left(ax_{10} + c\left(z_{10} + \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - \\ b\left(y_{10} - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_{10} + \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs X}$$

$$\mathbf{B_{41}} = x_{11}\,\mathbf{a}_1 + y_{11}\,\mathbf{a}_2 + z_{11}\,\mathbf{a}_3 = \left(ax_{11} + cz_{11}\cos\beta\right)\hat{\mathbf{x}} + by_{11}\,\hat{\mathbf{y}} + cz_{11}\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{Cs XI}$$

$$\mathbf{B_{42}} = \begin{array}{c}-x_{11}\,\mathbf{a}_1 + \left(y_{11} + \tfrac{1}{2}\right)\mathbf{a}_2 - \\ \left(z_{11} - \tfrac{1}{2}\right)\mathbf{a}_3\end{array} = \begin{array}{l}-\left(ax_{11} + c\left(z_{11} - \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + \\ b\left(y_{11} + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_{11} - \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs XI}$$

$$\mathbf{B_{43}} = -x_{11}\,\mathbf{a}_1 - y_{11}\,\mathbf{a}_2 - z_{11}\,\mathbf{a}_3 = \begin{array}{l}-\left(ax_{11} + cz_{11}\cos\beta\right)\hat{\mathbf{x}} - by_{11}\,\hat{\mathbf{y}} - \\ cz_{11}\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs XI}$$

$$\mathbf{B_{44}} = \begin{array}{c}x_{11}\,\mathbf{a}_1 - \left(y_{11} - \tfrac{1}{2}\right)\mathbf{a}_2 + \\ \left(z_{11} + \tfrac{1}{2}\right)\mathbf{a}_3\end{array} = \begin{array}{l}\left(ax_{11} + c\left(z_{11} + \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - \\ b\left(y_{11} - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_{11} + \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{Cs XI}$$

$$\mathbf{B_{45}} = x_{12}\,\mathbf{a}_1 + y_{12}\,\mathbf{a}_2 + z_{12}\,\mathbf{a}_3 = \left(ax_{12} + cz_{12}\cos\beta\right)\hat{\mathbf{x}} + by_{12}\,\hat{\mathbf{y}} + cz_{12}\sin\beta\,\hat{\mathbf{z}} \quad (4e) \quad \text{O I}$$

$$\mathbf{B_{46}} = \begin{array}{c}-x_{12}\,\mathbf{a}_1 + \left(y_{12} + \tfrac{1}{2}\right)\mathbf{a}_2 - \\ \left(z_{12} - \tfrac{1}{2}\right)\mathbf{a}_3\end{array} = \begin{array}{l}-\left(ax_{12} + c\left(z_{12} - \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + \\ b\left(y_{12} + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_{12} - \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{O I}$$

$$\mathbf{B_{47}} = -x_{12}\,\mathbf{a}_1 - y_{12}\,\mathbf{a}_2 - z_{12}\,\mathbf{a}_3 = \begin{array}{l}-\left(ax_{12} + cz_{12}\cos\beta\right)\hat{\mathbf{x}} - by_{12}\,\hat{\mathbf{y}} - \\ cz_{12}\sin\beta\,\hat{\mathbf{z}}\end{array} \quad (4e) \quad \text{O I}$$

$$\mathbf{B_{48}} = x_{12}\,\mathbf{a}_1 - \left(y_{12} - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_{12} + \tfrac{1}{2}\right)\mathbf{a}_3 = \left(ax_{12} + c\left(z_{12} + \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - b\left(y_{12} - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_{12} + \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \qquad (4e) \qquad \text{O I}$$

$$\mathbf{B_{49}} = x_{13}\,\mathbf{a}_1 + y_{13}\,\mathbf{a}_2 + z_{13}\,\mathbf{a}_3 = \left(ax_{13} + cz_{13}\cos\beta\right)\hat{\mathbf{x}} + by_{13}\,\hat{\mathbf{y}} + cz_{13}\sin\beta\,\hat{\mathbf{z}} \qquad (4e) \qquad \text{O II}$$

$$\mathbf{B_{50}} = -x_{13}\,\mathbf{a}_1 + \left(y_{13} + \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_{13} - \tfrac{1}{2}\right)\mathbf{a}_3 = -\left(ax_{13} + c\left(z_{13} - \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + b\left(y_{13} + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_{13} - \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \qquad (4e) \qquad \text{O II}$$

$$\mathbf{B_{51}} = -x_{13}\,\mathbf{a}_1 - y_{13}\,\mathbf{a}_2 - z_{13}\,\mathbf{a}_3 = -\left(ax_{13} + cz_{13}\cos\beta\right)\hat{\mathbf{x}} - by_{13}\,\hat{\mathbf{y}} - cz_{13}\sin\beta\,\hat{\mathbf{z}} \qquad (4e) \qquad \text{O II}$$

$$\mathbf{B_{52}} = x_{13}\,\mathbf{a}_1 - \left(y_{13} - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_{13} + \tfrac{1}{2}\right)\mathbf{a}_3 = \left(ax_{13} + c\left(z_{13} + \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - b\left(y_{13} - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_{13} + \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \qquad (4e) \qquad \text{O II}$$

$$\mathbf{B_{53}} = x_{14}\,\mathbf{a}_1 + y_{14}\,\mathbf{a}_2 + z_{14}\,\mathbf{a}_3 = \left(ax_{14} + cz_{14}\cos\beta\right)\hat{\mathbf{x}} + by_{14}\,\hat{\mathbf{y}} + cz_{14}\sin\beta\,\hat{\mathbf{z}} \qquad (4e) \qquad \text{O III}$$

$$\mathbf{B_{54}} = -x_{14}\,\mathbf{a}_1 + \left(y_{14} + \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_{14} - \tfrac{1}{2}\right)\mathbf{a}_3 = -\left(ax_{14} + c\left(z_{14} - \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} + b\left(y_{14} + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_{14} - \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \qquad (4e) \qquad \text{O III}$$

$$\mathbf{B_{55}} = -x_{14}\,\mathbf{a}_1 - y_{14}\,\mathbf{a}_2 - z_{14}\,\mathbf{a}_3 = -\left(ax_{14} + cz_{14}\cos\beta\right)\hat{\mathbf{x}} - by_{14}\,\hat{\mathbf{y}} - cz_{14}\sin\beta\,\hat{\mathbf{z}} \qquad (4e) \qquad \text{O III}$$

$$\mathbf{B_{56}} = x_{14}\,\mathbf{a}_1 - \left(y_{14} - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_{14} + \tfrac{1}{2}\right)\mathbf{a}_3 = \left(ax_{14} + c\left(z_{14} + \tfrac{1}{2}\right)\cos\beta\right)\hat{\mathbf{x}} - b\left(y_{14} - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_{14} + \tfrac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}} \qquad (4e) \qquad \text{O III}$$

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