Ce$_5$Mo$_3$O$_{16}$ Structure: A5B3C16_cP96_222_ce_d_fi-001

This structure originally had the label `A5B3C16_cP96_222_ce_d_fi`. Calls to that address will be redirected here.

https://aflow.org/p/3NUA

https://aflow.org/p/A5B3C16_cP96_222_ce_d_fi-001
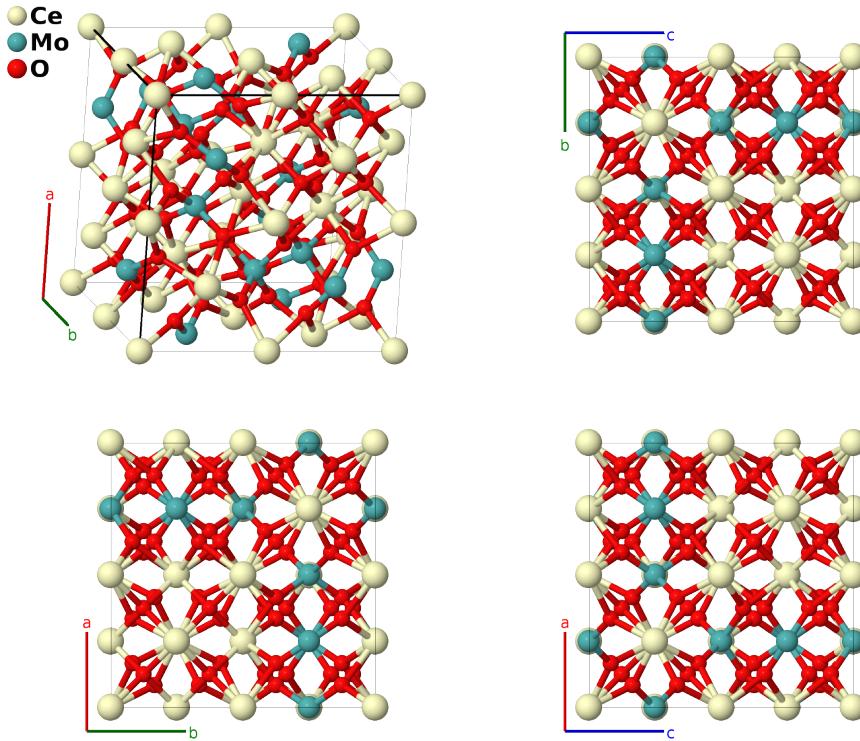
Prototype	Ce$_5$Mo$_3$O$_{16}$
AFLOW prototype label	A5B3C16_cP96_222_ce_d_fi-001
ICSD	none
Pearson symbol	cP96
Space group number	222
Space group symbol	$Pn\overline{3}n$
AFLOW prototype command	aflow --proto=A5B3C16_cP96_222_ce_d_fi-001 --params=$a, x_3, x_4, x_5, y_5, z_5$

Other compounds with this structure

CdTm$_4$MoO$_3$O$_{16}$, CdY$_4$Mo$_3$O$_{16}$, La$_5$Mo$_3$O$_{16}$, Nd$_5$Mo$_3$O$_{16}$

Simple Cubic primitive vectors

$$\mathbf{a_1} = a\,\hat{\mathbf{x}}$$
$$\mathbf{a_2} = a\,\hat{\mathbf{y}}$$
$$\mathbf{a_3} = a\,\hat{\mathbf{z}}$$
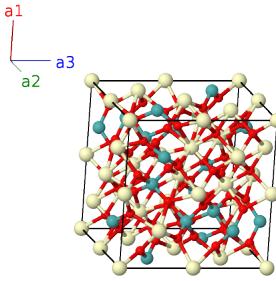
Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_1}$	$=$	0	$=$	0	(8c)	Ce I
$\mathbf{B_2}$	$=$	$\frac{1}{2}\mathbf{a_1} + \frac{1}{2}\mathbf{a_2}$	$=$	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}}$	(8c)	Ce I
$\mathbf{B_3}$	$=$	$\frac{1}{2}\mathbf{a_1} + \frac{1}{2}\mathbf{a_3}$	$=$	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(8c)	Ce I
$\mathbf{B_4}$	$=$	$\frac{1}{2}\mathbf{a_2} + \frac{1}{2}\mathbf{a_3}$	$=$	$\frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(8c)	Ce I
$\mathbf{B_5}$	$=$	$\frac{1}{2}\mathbf{a_3}$	$=$	$\frac{1}{2}a\,\hat{\mathbf{z}}$	(8c)	Ce I
$\mathbf{B_6}$	$=$	$\frac{1}{2}\mathbf{a_1} + \frac{1}{2}\mathbf{a_2} + \frac{1}{2}\mathbf{a_3}$	$=$	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(8c)	Ce I
$\mathbf{B_7}$	$=$	$\frac{1}{2}\mathbf{a_2}$	$=$	$\frac{1}{2}a\,\hat{\mathbf{y}}$	(8c)	Ce I
$\mathbf{B_8}$	$=$	$\frac{1}{2}\mathbf{a_1}$	$=$	$\frac{1}{2}a\,\hat{\mathbf{x}}$	(8c)	Ce I
$\mathbf{B_9}$	$=$	$\frac{3}{4}\mathbf{a_2} + \frac{1}{4}\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(12d)	Mo I
$\mathbf{B_{10}}$	$=$	$\frac{1}{2}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} + \frac{1}{4}\mathbf{a_3}$	$=$	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(12d)	Mo I
$\mathbf{B_{11}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(12d)	Mo I
$\mathbf{B_{12}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{2}\mathbf{a_2} + \frac{3}{4}\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(12d)	Mo I
$\mathbf{B_{13}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}}$	(12d)	Mo I
$\mathbf{B_{14}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + \frac{1}{2}\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(12d)	Mo I
$\mathbf{B_{15}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(12d)	Mo I
$\mathbf{B_{16}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{1}{2}\mathbf{a_2} + \frac{1}{4}\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(12d)	Mo I
$\mathbf{B_{17}}$	$=$	$\frac{1}{4}\mathbf{a_2} + \frac{3}{4}\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(12d)	Mo I
$\mathbf{B_{18}}$	$=$	$\frac{1}{2}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + \frac{3}{4}\mathbf{a_3}$	$=$	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(12d)	Mo I
$\mathbf{B_{19}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} + \frac{1}{2}\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(12d)	Mo I
$\mathbf{B_{20}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}}$	(12d)	Mo I
$\mathbf{B_{21}}$	$=$	$x_3\,\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + \frac{1}{4}\mathbf{a_3}$	$=$	$ax_3\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(12e)	Ce II
$\mathbf{B_{22}}$	$=$	$-\left(x_3 - \frac{1}{2}\right)\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + \frac{1}{4}\mathbf{a_3}$	$=$	$-a\left(x_3 - \frac{1}{2}\right)\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(12e)	Ce II
$\mathbf{B_{23}}$	$=$	$\frac{1}{4}\mathbf{a_1} + x_3\,\mathbf{a_2} + \frac{1}{4}\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + ax_3\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(12e)	Ce II
$\mathbf{B_{24}}$	$=$	$\frac{1}{4}\mathbf{a_1} - \left(x_3 - \frac{1}{2}\right)\mathbf{a_2} + \frac{1}{4}\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} - a\left(x_3 - \frac{1}{2}\right)\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(12e)	Ce II
$\mathbf{B_{25}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + x_3\,\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + ax_3\,\hat{\mathbf{z}}$	(12e)	Ce II
$\mathbf{B_{26}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} - \left(x_3 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} - a\left(x_3 - \frac{1}{2}\right)\hat{\mathbf{z}}$	(12e)	Ce II
$\mathbf{B_{27}}$	$=$	$-x_3\,\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} + \frac{3}{4}\mathbf{a_3}$	$=$	$-ax_3\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(12e)	Ce II
$\mathbf{B_{28}}$	$=$	$\left(x_3 + \frac{1}{2}\right)\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} + \frac{3}{4}\mathbf{a_3}$	$=$	$a\left(x_3 + \frac{1}{2}\right)\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(12e)	Ce II
$\mathbf{B_{29}}$	$=$	$\frac{3}{4}\mathbf{a_1} - x_3\,\mathbf{a_2} + \frac{3}{4}\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} - ax_3\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(12e)	Ce II
$\mathbf{B_{30}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \left(x_3 + \frac{1}{2}\right)\mathbf{a_2} + \frac{3}{4}\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + a\left(x_3 + \frac{1}{2}\right)\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(12e)	Ce II

$$\mathbf{B_{31}} = \tfrac{3}{4}\mathbf{a}_1 + \tfrac{3}{4}\mathbf{a}_2 - x_3\mathbf{a}_3 = \tfrac{3}{4}a\,\hat{\mathbf{x}} + \tfrac{3}{4}a\,\hat{\mathbf{y}} - ax_3\,\hat{\mathbf{z}} \qquad (12e) \qquad \text{Ce II}$$

$$\mathbf{B_{32}} = \tfrac{3}{4}\mathbf{a}_1 + \tfrac{3}{4}\mathbf{a}_2 + \left(x_3 + \tfrac{1}{2}\right)\mathbf{a}_3 = \tfrac{3}{4}a\,\hat{\mathbf{x}} + \tfrac{3}{4}a\,\hat{\mathbf{y}} + a\left(x_3 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (12e) \qquad \text{Ce II}$$

$$\mathbf{B_{33}} = x_4\mathbf{a}_1 + x_4\mathbf{a}_2 + x_4\mathbf{a}_3 = ax_4\,\hat{\mathbf{x}} + ax_4\,\hat{\mathbf{y}} + ax_4\,\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{34}} = -\left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_2 + x_4\mathbf{a}_3 = -a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + ax_4\,\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{35}} = -\left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_1 + x_4\mathbf{a}_2 - \left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ax_4\,\hat{\mathbf{y}} - a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{36}} = x_4\mathbf{a}_1 - \left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_2 - \left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_3 = ax_4\,\hat{\mathbf{x}} - a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{y}} - a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{37}} = x_4\mathbf{a}_1 + x_4\mathbf{a}_2 - \left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_3 = ax_4\,\hat{\mathbf{x}} + ax_4\,\hat{\mathbf{y}} - a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{38}} = -\left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_2 - \left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{y}} - a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{39}} = x_4\mathbf{a}_1 - \left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_2 + x_4\mathbf{a}_3 = ax_4\,\hat{\mathbf{x}} - a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + ax_4\,\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{40}} = -\left(x_4 - \tfrac{1}{2}\right)\mathbf{a}_1 + x_4\mathbf{a}_2 + x_4\mathbf{a}_3 = -a\left(x_4 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ax_4\,\hat{\mathbf{y}} + ax_4\,\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{41}} = -x_4\mathbf{a}_1 - x_4\mathbf{a}_2 - x_4\mathbf{a}_3 = -ax_4\,\hat{\mathbf{x}} - ax_4\,\hat{\mathbf{y}} - ax_4\,\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{42}} = \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_1 + \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_2 - x_4\mathbf{a}_3 = a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - ax_4\,\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{43}} = \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_1 - x_4\mathbf{a}_2 + \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_3 = a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ax_4\,\hat{\mathbf{y}} + a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{44}} = -x_4\mathbf{a}_1 + \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_2 + \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_3 = -ax_4\,\hat{\mathbf{x}} + a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{y}} + a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{45}} = -x_4\mathbf{a}_1 - x_4\mathbf{a}_2 + \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_3 = -ax_4\,\hat{\mathbf{x}} - ax_4\,\hat{\mathbf{y}} + a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{46}} = \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_1 + \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_2 + \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_3 = a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{y}} + a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{47}} = -x_4\mathbf{a}_1 + \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_2 - x_4\mathbf{a}_3 = -ax_4\,\hat{\mathbf{x}} + a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - ax_4\,\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{48}} = \left(x_4 + \tfrac{1}{2}\right)\mathbf{a}_1 - x_4\mathbf{a}_2 - x_4\mathbf{a}_3 = a\left(x_4 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ax_4\,\hat{\mathbf{y}} - ax_4\,\hat{\mathbf{z}} \qquad (16f) \qquad \text{O I}$$

$$\mathbf{B_{49}} = x_5\mathbf{a}_1 + y_5\mathbf{a}_2 + z_5\mathbf{a}_3 = ax_5\,\hat{\mathbf{x}} + ay_5\,\hat{\mathbf{y}} + az_5\,\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{50}} = -\left(x_5 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(y_5 - \tfrac{1}{2}\right)\mathbf{a}_2 + z_5\mathbf{a}_3 = -a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + az_5\,\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{51}} = -\left(x_5 - \tfrac{1}{2}\right)\mathbf{a}_1 + y_5\mathbf{a}_2 - \left(z_5 - \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ay_5\,\hat{\mathbf{y}} - a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{52}} = x_5\mathbf{a}_1 - \left(y_5 - \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_5 - \tfrac{1}{2}\right)\mathbf{a}_3 = ax_5\,\hat{\mathbf{x}} - a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} - a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{53}} = z_5\mathbf{a}_1 + x_5\mathbf{a}_2 + y_5\mathbf{a}_3 = az_5\,\hat{\mathbf{x}} + ax_5\,\hat{\mathbf{y}} + ay_5\,\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{54}} = z_5\mathbf{a}_1 - \left(x_5 - \tfrac{1}{2}\right)\mathbf{a}_2 - \left(y_5 - \tfrac{1}{2}\right)\mathbf{a}_3 = az_5\,\hat{\mathbf{x}} - a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} - a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{55}} = -\left(z_5 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(x_5 - \tfrac{1}{2}\right)\mathbf{a}_2 + y_5\mathbf{a}_3 = -a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + ay_5\,\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{56}} = -\left(z_5 - \tfrac{1}{2}\right)\mathbf{a}_1 + x_5\mathbf{a}_2 - \left(y_5 - \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ax_5\,\hat{\mathbf{y}} - a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{57}} = y_5\mathbf{a}_1 + z_5\mathbf{a}_2 + x_5\mathbf{a}_3 = ay_5\,\hat{\mathbf{x}} + az_5\,\hat{\mathbf{y}} + ax_5\,\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{58}} = -\left(y_5 - \tfrac{1}{2}\right)\mathbf{a}_1 + z_5\mathbf{a}_2 - \left(x_5 - \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + az_5\,\hat{\mathbf{y}} - a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{59}} = y_5\mathbf{a}_1 - \left(z_5 - \tfrac{1}{2}\right)\mathbf{a}_2 - \left(x_5 - \tfrac{1}{2}\right)\mathbf{a}_3 = ay_5\,\hat{\mathbf{x}} - a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} - a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{60}} = -\left(y_5 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(z_5 - \tfrac{1}{2}\right)\mathbf{a}_2 + x_5\mathbf{a}_3 = -a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + ax_5\,\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{61}} = y_5\mathbf{a}_1 + x_5\mathbf{a}_2 - \left(z_5 - \tfrac{1}{2}\right)\mathbf{a}_3 = ay_5\,\hat{\mathbf{x}} + ax_5\,\hat{\mathbf{y}} - a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{62}} = -\left(y_5 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(x_5 - \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_5 - \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} - a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (48i) \qquad \text{O II}$$

$$\mathbf{B_{63}} = y_5\,\mathbf{a_1} - \left(x_5 - \tfrac{1}{2}\right)\mathbf{a_2} + z_5\,\mathbf{a_3} = ay_5\,\hat{\mathbf{x}} - a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + az_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{64}} = -\left(y_5 - \tfrac{1}{2}\right)\mathbf{a_1} + x_5\,\mathbf{a_2} + z_5\,\mathbf{a_3} = -a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ax_5\,\hat{\mathbf{y}} + az_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{65}} = x_5\,\mathbf{a_1} + z_5\,\mathbf{a_2} - \left(y_5 - \tfrac{1}{2}\right)\mathbf{a_3} = ax_5\,\hat{\mathbf{x}} + az_5\,\hat{\mathbf{y}} - a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{66}} = -\left(x_5 - \tfrac{1}{2}\right)\mathbf{a_1} + z_5\,\mathbf{a_2} + y_5\,\mathbf{a_3} = -a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + az_5\,\hat{\mathbf{y}} + ay_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{67}} = -\left(x_5 - \tfrac{1}{2}\right)\mathbf{a_1} - \left(z_5 - \tfrac{1}{2}\right)\mathbf{a_2} - \left(y_5 - \tfrac{1}{2}\right)\mathbf{a_3} = -a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} - a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{68}} = x_5\,\mathbf{a_1} - \left(z_5 - \tfrac{1}{2}\right)\mathbf{a_2} + y_5\,\mathbf{a_3} = ax_5\,\hat{\mathbf{x}} - a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + ay_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{69}} = z_5\,\mathbf{a_1} + y_5\,\mathbf{a_2} - \left(x_5 - \tfrac{1}{2}\right)\mathbf{a_3} = az_5\,\hat{\mathbf{x}} + ay_5\,\hat{\mathbf{y}} - a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{70}} = z_5\,\mathbf{a_1} - \left(y_5 - \tfrac{1}{2}\right)\mathbf{a_2} + x_5\,\mathbf{a_3} = az_5\,\hat{\mathbf{x}} - a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + ax_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{71}} = -\left(z_5 - \tfrac{1}{2}\right)\mathbf{a_1} + y_5\,\mathbf{a_2} + x_5\,\mathbf{a_3} = -a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ay_5\,\hat{\mathbf{y}} + ax_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{72}} = -\left(z_5 - \tfrac{1}{2}\right)\mathbf{a_1} - \left(y_5 - \tfrac{1}{2}\right)\mathbf{a_2} - \left(x_5 - \tfrac{1}{2}\right)\mathbf{a_3} = -a\left(z_5 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_5 - \tfrac{1}{2}\right)\hat{\mathbf{y}} - a\left(x_5 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{73}} = -x_5\,\mathbf{a_1} - y_5\,\mathbf{a_2} - z_5\,\mathbf{a_3} = -ax_5\,\hat{\mathbf{x}} - ay_5\,\hat{\mathbf{y}} - az_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{74}} = \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_1} + \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_2} - z_5\,\mathbf{a_3} = a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - az_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{75}} = \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_1} - y_5\,\mathbf{a_2} + \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_3} = a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ay_5\,\hat{\mathbf{y}} + a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{76}} = -x_5\,\mathbf{a_1} + \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_2} + \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_3} = -ax_5\,\hat{\mathbf{x}} + a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} + a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{77}} = -z_5\,\mathbf{a_1} - x_5\,\mathbf{a_2} - y_5\,\mathbf{a_3} = -az_5\,\hat{\mathbf{x}} - ax_5\,\hat{\mathbf{y}} - ay_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{78}} = -z_5\,\mathbf{a_1} + \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_2} + \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_3} = -az_5\,\hat{\mathbf{x}} + a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} + a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{79}} = \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_1} + \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_2} - y_5\,\mathbf{a_3} = a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - ay_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{80}} = \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_1} - x_5\,\mathbf{a_2} + \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_3} = a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ax_5\,\hat{\mathbf{y}} + a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{81}} = -y_5\,\mathbf{a_1} - z_5\,\mathbf{a_2} - x_5\,\mathbf{a_3} = -ay_5\,\hat{\mathbf{x}} - az_5\,\hat{\mathbf{y}} - ax_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{82}} = \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_1} - z_5\,\mathbf{a_2} + \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_3} = a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - az_5\,\hat{\mathbf{y}} + a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{83}} = -y_5\,\mathbf{a_1} + \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_2} + \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_3} = -ay_5\,\hat{\mathbf{x}} + a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} + a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{84}} = \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_1} + \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_2} - x_5\,\mathbf{a_3} = a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - ax_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{85}} = -y_5\,\mathbf{a_1} - x_5\,\mathbf{a_2} + \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_3} = -ay_5\,\hat{\mathbf{x}} - ax_5\,\hat{\mathbf{y}} + a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{86}} = \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_1} + \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_2} + \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_3} = a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} + a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{87}} = -y_5\,\mathbf{a_1} + \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_2} - z_5\,\mathbf{a_3} = -ay_5\,\hat{\mathbf{x}} + a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - az_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{88}} = \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_1} - x_5\,\mathbf{a_2} - z_5\,\mathbf{a_3} = a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ax_5\,\hat{\mathbf{y}} - az_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{89}} = -x_5\,\mathbf{a_1} - z_5\,\mathbf{a_2} + \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_3} = -ax_5\,\hat{\mathbf{x}} - az_5\,\hat{\mathbf{y}} + a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{90}} = \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_1} - z_5\,\mathbf{a_2} - y_5\,\mathbf{a_3} = a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - az_5\,\hat{\mathbf{y}} - ay_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{91}} = \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_1} + \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_2} + \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_3} = a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} + a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{92}} = -x_5\,\mathbf{a_1} + \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_2} - y_5\,\mathbf{a_3} = -ax_5\,\hat{\mathbf{x}} + a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - ay_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{93}} = -z_5\,\mathbf{a_1} - y_5\,\mathbf{a_2} + \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_3} = -az_5\,\hat{\mathbf{x}} - ay_5\,\hat{\mathbf{y}} + a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{94}} = -z_5\,\mathbf{a_1} + \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_2} - x_5\,\mathbf{a_3} = -az_5\,\hat{\mathbf{x}} + a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - ax_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{95}} = \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_1} - y_5\,\mathbf{a_2} - x_5\,\mathbf{a_3} = a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ay_5\,\hat{\mathbf{y}} - ax_5\,\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

$$\mathbf{B_{96}} = \left(z_5 + \tfrac{1}{2}\right)\mathbf{a_1} + \left(y_5 + \tfrac{1}{2}\right)\mathbf{a_2} + \left(x_5 + \tfrac{1}{2}\right)\mathbf{a_3} = a\left(z_5 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_5 + \tfrac{1}{2}\right)\hat{\mathbf{y}} + a\left(x_5 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48\text{i}) \quad \text{O II}$$

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