$Na_4Ge_9O_{20}$ Structure: A9B4C20_tI132_88_a2f_f_5f-001

This structure originally had the label `A9B4C20_tI132_88_a2f_f_5f`. Calls to that address will be redirected here.

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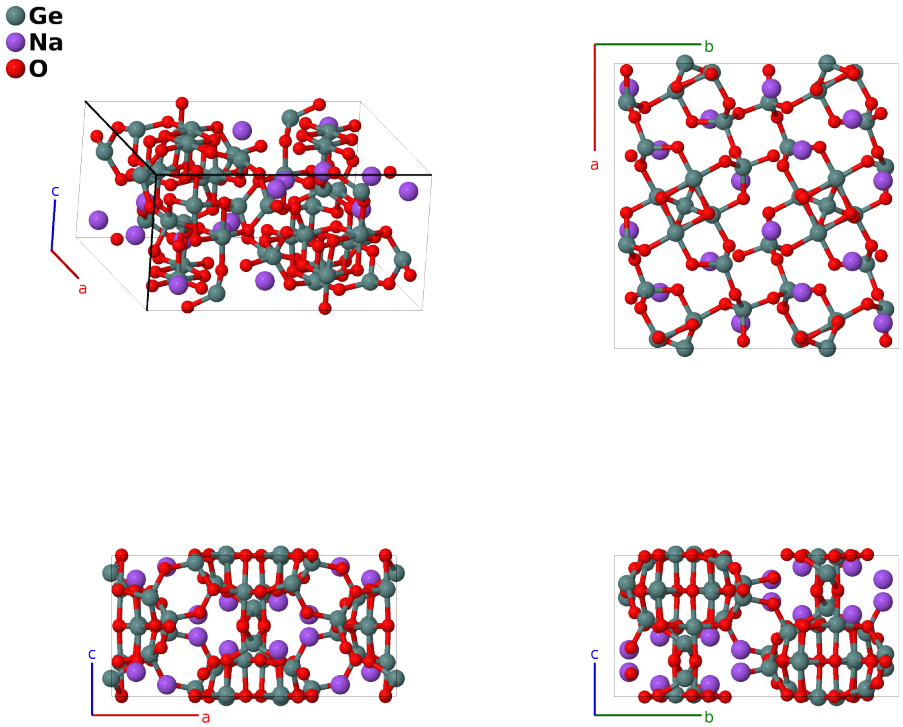
https://aflow.org/p/JMG5

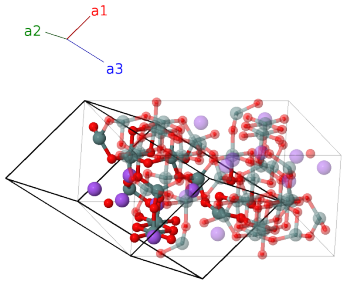
https://aflow.org/p/A9B4C20_tI132_88_a2f_f_5f-001



Prototype	$Ge_9Na_4O_{20}$
AFLOW prototype label	A9B4C20_tI132_88_a2f_f_5f-001
ICSD	24087
Pearson symbol	tI132
Space group number	88
Space group symbol	$I4_1/a$
AFLOW prototype command	`aflow --proto=A9B4C20_tI132_88_a2f_f_5f-001 --params=`$a, c/a, x_2, y_2, z_2, x_3, y_3, z_3, x_4, y_4, z_4, x_5, y_5, z_5, x_6, y_6, z_6, x_7, y_7, z_7, x_8, y_8, z_8, x_9, y_9, z_9$

Body-centered Tetragonal primitive vectors

$$\mathbf{a_1} = -\tfrac{1}{2}a\,\hat{\mathbf{x}} + \tfrac{1}{2}a\,\hat{\mathbf{y}} + \tfrac{1}{2}c\,\hat{\mathbf{z}}$$
$$\mathbf{a_2} = \tfrac{1}{2}a\,\hat{\mathbf{x}} - \tfrac{1}{2}a\,\hat{\mathbf{y}} + \tfrac{1}{2}c\,\hat{\mathbf{z}}$$
$$\mathbf{a_3} = \tfrac{1}{2}a\,\hat{\mathbf{x}} + \tfrac{1}{2}a\,\hat{\mathbf{y}} - \tfrac{1}{2}c\,\hat{\mathbf{z}}$$



Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_1}$	=	$\frac{3}{8}\,\mathbf{a}_1 + \frac{1}{8}\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{8}c\,\hat{\mathbf{z}}$	(4a)	Ge I
$\mathbf{B_2}$	=	$\frac{5}{8}\,\mathbf{a}_1 + \frac{7}{8}\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{3}{8}c\,\hat{\mathbf{z}}$	(4a)	Ge I
$\mathbf{B_3}$	=	$(y_2+z_2)\,\mathbf{a}_1 + (x_2+z_2)\,\mathbf{a}_2 + (x_2+y_2)\,\mathbf{a}_3$	=	$ax_2\,\hat{\mathbf{x}} + ay_2\,\hat{\mathbf{y}} + cz_2\,\hat{\mathbf{z}}$	(16f)	Ge II
$\mathbf{B_4}$	=	$\left(-y_2+z_2+\frac{1}{2}\right)\,\mathbf{a}_1 - (x_2-z_2)\,\mathbf{a}_2 - \left(x_2+y_2-\frac{1}{2}\right)\,\mathbf{a}_3$	=	$-ax_2\,\hat{\mathbf{x}} - a\left(y_2-\frac{1}{2}\right)\,\hat{\mathbf{y}} + cz_2\,\hat{\mathbf{z}}$	(16f)	Ge II
$\mathbf{B_5}$	=	$\left(x_2+z_2+\frac{1}{2}\right)\,\mathbf{a}_1 - (y_2-z_2)\,\mathbf{a}_2 + (x_2-y_2)\,\mathbf{a}_3$	=	$-a\left(y_2+\frac{1}{4}\right)\,\hat{\mathbf{x}} + a\left(x_2+\frac{1}{4}\right)\,\hat{\mathbf{y}} + c\left(z_2+\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(16f)	Ge II
$\mathbf{B_6}$	=	$\left(-x_2+z_2+\frac{1}{2}\right)\,\mathbf{a}_1 + \left(y_2+z_2+\frac{1}{2}\right)\,\mathbf{a}_2 + \left(-x_2+y_2+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$a\left(y_2+\frac{1}{4}\right)\,\hat{\mathbf{x}} - a\left(x_2-\frac{1}{4}\right)\,\hat{\mathbf{y}} + c\left(z_2+\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(16f)	Ge II
$\mathbf{B_7}$	=	$-(y_2+z_2)\,\mathbf{a}_1 - (x_2+z_2)\,\mathbf{a}_2 - (x_2+y_2)\,\mathbf{a}_3$	=	$-ax_2\,\hat{\mathbf{x}} - ay_2\,\hat{\mathbf{y}} - cz_2\,\hat{\mathbf{z}}$	(16f)	Ge II
$\mathbf{B_8}$	=	$\left(y_2-z_2+\frac{1}{2}\right)\,\mathbf{a}_1 + (x_2-z_2)\,\mathbf{a}_2 + \left(x_2+y_2+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$ax_2\,\hat{\mathbf{x}} + a\left(y_2+\frac{1}{2}\right)\,\hat{\mathbf{y}} - cz_2\,\hat{\mathbf{z}}$	(16f)	Ge II
$\mathbf{B_9}$	=	$-\left(x_2+z_2-\frac{1}{2}\right)\,\mathbf{a}_1 + (y_2-z_2)\,\mathbf{a}_2 - (x_2-y_2)\,\mathbf{a}_3$	=	$a\left(y_2-\frac{1}{4}\right)\,\hat{\mathbf{x}} - a\left(x_2-\frac{1}{4}\right)\,\hat{\mathbf{y}} - c\left(z_2-\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(16f)	Ge II
$\mathbf{B_{10}}$	=	$\left(x_2-z_2+\frac{1}{2}\right)\,\mathbf{a}_1 - \left(y_2+z_2-\frac{1}{2}\right)\,\mathbf{a}_2 + \left(x_2-y_2+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$-a\left(y_2-\frac{1}{4}\right)\,\hat{\mathbf{x}} + a\left(x_2+\frac{1}{4}\right)\,\hat{\mathbf{y}} - c\left(z_2-\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(16f)	Ge II
$\mathbf{B_{11}}$	=	$(y_3+z_3)\,\mathbf{a}_1 + (x_3+z_3)\,\mathbf{a}_2 + (x_3+y_3)\,\mathbf{a}_3$	=	$ax_3\,\hat{\mathbf{x}} + ay_3\,\hat{\mathbf{y}} + cz_3\,\hat{\mathbf{z}}$	(16f)	Ge III
$\mathbf{B_{12}}$	=	$\left(-y_3+z_3+\frac{1}{2}\right)\,\mathbf{a}_1 - (x_3-z_3)\,\mathbf{a}_2 - \left(x_3+y_3-\frac{1}{2}\right)\,\mathbf{a}_3$	=	$-ax_3\,\hat{\mathbf{x}} - a\left(y_3-\frac{1}{2}\right)\,\hat{\mathbf{y}} + cz_3\,\hat{\mathbf{z}}$	(16f)	Ge III
$\mathbf{B_{13}}$	=	$\left(x_3+z_3+\frac{1}{2}\right)\,\mathbf{a}_1 - (y_3-z_3)\,\mathbf{a}_2 + (x_3-y_3)\,\mathbf{a}_3$	=	$-a\left(y_3+\frac{1}{4}\right)\,\hat{\mathbf{x}} + a\left(x_3+\frac{1}{4}\right)\,\hat{\mathbf{y}} + c\left(z_3+\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(16f)	Ge III
$\mathbf{B_{14}}$	=	$\left(-x_3+z_3+\frac{1}{2}\right)\,\mathbf{a}_1 + \left(y_3+z_3+\frac{1}{2}\right)\,\mathbf{a}_2 + \left(-x_3+y_3+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$a\left(y_3+\frac{1}{4}\right)\,\hat{\mathbf{x}} - a\left(x_3-\frac{1}{4}\right)\,\hat{\mathbf{y}} + c\left(z_3+\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(16f)	Ge III
$\mathbf{B_{15}}$	=	$-(y_3+z_3)\,\mathbf{a}_1 - (x_3+z_3)\,\mathbf{a}_2 - (x_3+y_3)\,\mathbf{a}_3$	=	$-ax_3\,\hat{\mathbf{x}} - ay_3\,\hat{\mathbf{y}} - cz_3\,\hat{\mathbf{z}}$	(16f)	Ge III
$\mathbf{B_{16}}$	=	$\left(y_3-z_3+\frac{1}{2}\right)\,\mathbf{a}_1 + (x_3-z_3)\,\mathbf{a}_2 + \left(x_3+y_3+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$ax_3\,\hat{\mathbf{x}} + a\left(y_3+\frac{1}{2}\right)\,\hat{\mathbf{y}} - cz_3\,\hat{\mathbf{z}}$	(16f)	Ge III

$\mathbf{B_{17}}$	$=$	$-\left(x_3+z_3-\frac{1}{2}\right)\mathbf{a}_1+\left(y_3-z_3\right)\mathbf{a}_2-\left(x_3-y_3\right)\mathbf{a}_3$	$=$	$a\left(y_3-\frac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_3-\frac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_3-\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	Ge III
$\mathbf{B_{18}}$	$=$	$\left(x_3-z_3+\frac{1}{2}\right)\mathbf{a}_1-\left(y_3+z_3-\frac{1}{2}\right)\mathbf{a}_2+\left(x_3-y_3+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-a\left(y_3-\frac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_3+\frac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_3-\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	Ge III
$\mathbf{B_{19}}$	$=$	$\left(y_4+z_4\right)\mathbf{a}_1+\left(x_4+z_4\right)\mathbf{a}_2+\left(x_4+y_4\right)\mathbf{a}_3$	$=$	$ax_4\,\hat{\mathbf{x}}+ay_4\,\hat{\mathbf{y}}+cz_4\,\hat{\mathbf{z}}$	(16f)	Na I
$\mathbf{B_{20}}$	$=$	$\left(-y_4+z_4+\frac{1}{2}\right)\mathbf{a}_1-\left(x_4-z_4\right)\mathbf{a}_2-\left(x_4+y_4-\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-ax_4\,\hat{\mathbf{x}}-a\left(y_4-\frac{1}{2}\right)\hat{\mathbf{y}}+cz_4\,\hat{\mathbf{z}}$	(16f)	Na I
$\mathbf{B_{21}}$	$=$	$\left(x_4+z_4+\frac{1}{2}\right)\mathbf{a}_1-\left(y_4-z_4\right)\mathbf{a}_2+\left(x_4-y_4\right)\mathbf{a}_3$	$=$	$-a\left(y_4+\frac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_4+\frac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_4+\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	Na I
$\mathbf{B_{22}}$	$=$	$\left(-x_4+z_4+\frac{1}{2}\right)\mathbf{a}_1+\left(y_4+z_4+\frac{1}{2}\right)\mathbf{a}_2+\left(-x_4+y_4+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$a\left(y_4+\frac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_4-\frac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_4+\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	Na I
$\mathbf{B_{23}}$	$=$	$-\left(y_4+z_4\right)\mathbf{a}_1-\left(x_4+z_4\right)\mathbf{a}_2-\left(x_4+y_4\right)\mathbf{a}_3$	$=$	$-ax_4\,\hat{\mathbf{x}}-ay_4\,\hat{\mathbf{y}}-cz_4\,\hat{\mathbf{z}}$	(16f)	Na I
$\mathbf{B_{24}}$	$=$	$\left(y_4-z_4+\frac{1}{2}\right)\mathbf{a}_1+\left(x_4-z_4\right)\mathbf{a}_2+\left(x_4+y_4+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$ax_4\,\hat{\mathbf{x}}+a\left(y_4+\frac{1}{2}\right)\hat{\mathbf{y}}-cz_4\,\hat{\mathbf{z}}$	(16f)	Na I
$\mathbf{B_{25}}$	$=$	$-\left(x_4+z_4-\frac{1}{2}\right)\mathbf{a}_1+\left(y_4-z_4\right)\mathbf{a}_2-\left(x_4-y_4\right)\mathbf{a}_3$	$=$	$a\left(y_4-\frac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_4-\frac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_4-\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	Na I
$\mathbf{B_{26}}$	$=$	$\left(x_4-z_4+\frac{1}{2}\right)\mathbf{a}_1-\left(y_4+z_4-\frac{1}{2}\right)\mathbf{a}_2+\left(x_4-y_4+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-a\left(y_4-\frac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_4+\frac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_4-\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	Na I
$\mathbf{B_{27}}$	$=$	$\left(y_5+z_5\right)\mathbf{a}_1+\left(x_5+z_5\right)\mathbf{a}_2+\left(x_5+y_5\right)\mathbf{a}_3$	$=$	$ax_5\,\hat{\mathbf{x}}+ay_5\,\hat{\mathbf{y}}+cz_5\,\hat{\mathbf{z}}$	(16f)	O I
$\mathbf{B_{28}}$	$=$	$\left(-y_5+z_5+\frac{1}{2}\right)\mathbf{a}_1-\left(x_5-z_5\right)\mathbf{a}_2-\left(x_5+y_5-\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-ax_5\,\hat{\mathbf{x}}-a\left(y_5-\frac{1}{2}\right)\hat{\mathbf{y}}+cz_5\,\hat{\mathbf{z}}$	(16f)	O I
$\mathbf{B_{29}}$	$=$	$\left(x_5+z_5+\frac{1}{2}\right)\mathbf{a}_1-\left(y_5-z_5\right)\mathbf{a}_2+\left(x_5-y_5\right)\mathbf{a}_3$	$=$	$-a\left(y_5+\frac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_5+\frac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_5+\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	O I
$\mathbf{B_{30}}$	$=$	$\left(-x_5+z_5+\frac{1}{2}\right)\mathbf{a}_1+\left(y_5+z_5+\frac{1}{2}\right)\mathbf{a}_2+\left(-x_5+y_5+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$a\left(y_5+\frac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_5-\frac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_5+\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	O I
$\mathbf{B_{31}}$	$=$	$-\left(y_5+z_5\right)\mathbf{a}_1-\left(x_5+z_5\right)\mathbf{a}_2-\left(x_5+y_5\right)\mathbf{a}_3$	$=$	$-ax_5\,\hat{\mathbf{x}}-ay_5\,\hat{\mathbf{y}}-cz_5\,\hat{\mathbf{z}}$	(16f)	O I
$\mathbf{B_{32}}$	$=$	$\left(y_5-z_5+\frac{1}{2}\right)\mathbf{a}_1+\left(x_5-z_5\right)\mathbf{a}_2+\left(x_5+y_5+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$ax_5\,\hat{\mathbf{x}}+a\left(y_5+\frac{1}{2}\right)\hat{\mathbf{y}}-cz_5\,\hat{\mathbf{z}}$	(16f)	O I
$\mathbf{B_{33}}$	$=$	$-\left(x_5+z_5-\frac{1}{2}\right)\mathbf{a}_1+\left(y_5-z_5\right)\mathbf{a}_2-\left(x_5-y_5\right)\mathbf{a}_3$	$=$	$a\left(y_5-\frac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_5-\frac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_5-\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	O I
$\mathbf{B_{34}}$	$=$	$\left(x_5-z_5+\frac{1}{2}\right)\mathbf{a}_1-\left(y_5+z_5-\frac{1}{2}\right)\mathbf{a}_2+\left(x_5-y_5+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-a\left(y_5-\frac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_5+\frac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_5-\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	O I
$\mathbf{B_{35}}$	$=$	$\left(y_6+z_6\right)\mathbf{a}_1+\left(x_6+z_6\right)\mathbf{a}_2+\left(x_6+y_6\right)\mathbf{a}_3$	$=$	$ax_6\,\hat{\mathbf{x}}+ay_6\,\hat{\mathbf{y}}+cz_6\,\hat{\mathbf{z}}$	(16f)	O II
$\mathbf{B_{36}}$	$=$	$\left(-y_6+z_6+\frac{1}{2}\right)\mathbf{a}_1-\left(x_6-z_6\right)\mathbf{a}_2-\left(x_6+y_6-\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-ax_6\,\hat{\mathbf{x}}-a\left(y_6-\frac{1}{2}\right)\hat{\mathbf{y}}+cz_6\,\hat{\mathbf{z}}$	(16f)	O II
$\mathbf{B_{37}}$	$=$	$\left(x_6+z_6+\frac{1}{2}\right)\mathbf{a}_1-\left(y_6-z_6\right)\mathbf{a}_2+\left(x_6-y_6\right)\mathbf{a}_3$	$=$	$-a\left(y_6+\frac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_6+\frac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_6+\frac{1}{4}\right)\hat{\mathbf{z}}$	(16f)	O II

$$\mathbf{B_{38}} = \begin{array}{c}\left(-x_6+z_6+\frac{1}{2}\right)\mathbf{a}_1+\\ \left(y_6+z_6+\frac{1}{2}\right)\mathbf{a}_2+\\ \left(-x_6+y_6+\frac{1}{2}\right)\mathbf{a}_3\end{array} = a\left(y_6+\tfrac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_6-\tfrac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_6+\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O II}$$

$$\mathbf{B_{39}} = \begin{array}{c}-\left(y_6+z_6\right)\mathbf{a}_1-\left(x_6+z_6\right)\mathbf{a}_2-\\ \left(x_6+y_6\right)\mathbf{a}_3\end{array} = -ax_6\,\hat{\mathbf{x}}-ay_6\,\hat{\mathbf{y}}-cz_6\,\hat{\mathbf{z}} \quad (16f) \quad \text{O II}$$

$$\mathbf{B_{40}} = \begin{array}{c}\left(y_6-z_6+\frac{1}{2}\right)\mathbf{a}_1+\\ \left(x_6-z_6\right)\mathbf{a}_2+\left(x_6+y_6+\frac{1}{2}\right)\mathbf{a}_3\end{array} = ax_6\,\hat{\mathbf{x}}+a\left(y_6+\tfrac{1}{2}\right)\hat{\mathbf{y}}-cz_6\,\hat{\mathbf{z}} \quad (16f) \quad \text{O II}$$

$$\mathbf{B_{41}} = \begin{array}{c}-\left(x_6+z_6-\frac{1}{2}\right)\mathbf{a}_1+\\ \left(y_6-z_6\right)\mathbf{a}_2-\left(x_6-y_6\right)\mathbf{a}_3\end{array} = a\left(y_6-\tfrac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_6-\tfrac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_6-\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O II}$$

$$\mathbf{B_{42}} = \begin{array}{c}\left(x_6-z_6+\frac{1}{2}\right)\mathbf{a}_1-\\ \left(y_6+z_6-\frac{1}{2}\right)\mathbf{a}_2+\\ \left(x_6-y_6+\frac{1}{2}\right)\mathbf{a}_3\end{array} = -a\left(y_6-\tfrac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_6+\tfrac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_6-\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O II}$$

$$\mathbf{B_{43}} = \begin{array}{c}\left(y_7+z_7\right)\mathbf{a}_1+\left(x_7+z_7\right)\mathbf{a}_2+\\ \left(x_7+y_7\right)\mathbf{a}_3\end{array} = ax_7\,\hat{\mathbf{x}}+ay_7\,\hat{\mathbf{y}}+cz_7\,\hat{\mathbf{z}} \quad (16f) \quad \text{O III}$$

$$\mathbf{B_{44}} = \begin{array}{c}\left(-y_7+z_7+\frac{1}{2}\right)\mathbf{a}_1-\\ \left(x_7-z_7\right)\mathbf{a}_2-\left(x_7+y_7-\frac{1}{2}\right)\mathbf{a}_3\end{array} = -ax_7\,\hat{\mathbf{x}}-a\left(y_7-\tfrac{1}{2}\right)\hat{\mathbf{y}}+cz_7\,\hat{\mathbf{z}} \quad (16f) \quad \text{O III}$$

$$\mathbf{B_{45}} = \begin{array}{c}\left(x_7+z_7+\frac{1}{2}\right)\mathbf{a}_1-\\ \left(y_7-z_7\right)\mathbf{a}_2+\left(x_7-y_7\right)\mathbf{a}_3\end{array} = -a\left(y_7+\tfrac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_7+\tfrac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_7+\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O III}$$

$$\mathbf{B_{46}} = \begin{array}{c}\left(-x_7+z_7+\frac{1}{2}\right)\mathbf{a}_1+\\ \left(y_7+z_7+\frac{1}{2}\right)\mathbf{a}_2+\\ \left(-x_7+y_7+\frac{1}{2}\right)\mathbf{a}_3\end{array} = a\left(y_7+\tfrac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_7-\tfrac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_7+\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O III}$$

$$\mathbf{B_{47}} = \begin{array}{c}-\left(y_7+z_7\right)\mathbf{a}_1-\left(x_7+z_7\right)\mathbf{a}_2-\\ \left(x_7+y_7\right)\mathbf{a}_3\end{array} = -ax_7\,\hat{\mathbf{x}}-ay_7\,\hat{\mathbf{y}}-cz_7\,\hat{\mathbf{z}} \quad (16f) \quad \text{O III}$$

$$\mathbf{B_{48}} = \begin{array}{c}\left(y_7-z_7+\frac{1}{2}\right)\mathbf{a}_1+\\ \left(x_7-z_7\right)\mathbf{a}_2+\left(x_7+y_7+\frac{1}{2}\right)\mathbf{a}_3\end{array} = ax_7\,\hat{\mathbf{x}}+a\left(y_7+\tfrac{1}{2}\right)\hat{\mathbf{y}}-cz_7\,\hat{\mathbf{z}} \quad (16f) \quad \text{O III}$$

$$\mathbf{B_{49}} = \begin{array}{c}-\left(x_7+z_7-\frac{1}{2}\right)\mathbf{a}_1+\\ \left(y_7-z_7\right)\mathbf{a}_2-\left(x_7-y_7\right)\mathbf{a}_3\end{array} = a\left(y_7-\tfrac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_7-\tfrac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_7-\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O III}$$

$$\mathbf{B_{50}} = \begin{array}{c}\left(x_7-z_7+\frac{1}{2}\right)\mathbf{a}_1-\\ \left(y_7+z_7-\frac{1}{2}\right)\mathbf{a}_2+\\ \left(x_7-y_7+\frac{1}{2}\right)\mathbf{a}_3\end{array} = -a\left(y_7-\tfrac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_7+\tfrac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_7-\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O III}$$

$$\mathbf{B_{51}} = \begin{array}{c}\left(y_8+z_8\right)\mathbf{a}_1+\left(x_8+z_8\right)\mathbf{a}_2+\\ \left(x_8+y_8\right)\mathbf{a}_3\end{array} = ax_8\,\hat{\mathbf{x}}+ay_8\,\hat{\mathbf{y}}+cz_8\,\hat{\mathbf{z}} \quad (16f) \quad \text{O IV}$$

$$\mathbf{B_{52}} = \begin{array}{c}\left(-y_8+z_8+\frac{1}{2}\right)\mathbf{a}_1-\\ \left(x_8-z_8\right)\mathbf{a}_2-\left(x_8+y_8-\frac{1}{2}\right)\mathbf{a}_3\end{array} = -ax_8\,\hat{\mathbf{x}}-a\left(y_8-\tfrac{1}{2}\right)\hat{\mathbf{y}}+cz_8\,\hat{\mathbf{z}} \quad (16f) \quad \text{O IV}$$

$$\mathbf{B_{53}} = \begin{array}{c}\left(x_8+z_8+\frac{1}{2}\right)\mathbf{a}_1-\\ \left(y_8-z_8\right)\mathbf{a}_2+\left(x_8-y_8\right)\mathbf{a}_3\end{array} = -a\left(y_8+\tfrac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_8+\tfrac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_8+\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O IV}$$

$$\mathbf{B_{54}} = \begin{array}{c}\left(-x_8+z_8+\frac{1}{2}\right)\mathbf{a}_1+\\ \left(y_8+z_8+\frac{1}{2}\right)\mathbf{a}_2+\\ \left(-x_8+y_8+\frac{1}{2}\right)\mathbf{a}_3\end{array} = a\left(y_8+\tfrac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_8-\tfrac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_8+\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O IV}$$

$$\mathbf{B_{55}} = \begin{array}{c}-\left(y_8+z_8\right)\mathbf{a}_1-\left(x_8+z_8\right)\mathbf{a}_2-\\ \left(x_8+y_8\right)\mathbf{a}_3\end{array} = -ax_8\,\hat{\mathbf{x}}-ay_8\,\hat{\mathbf{y}}-cz_8\,\hat{\mathbf{z}} \quad (16f) \quad \text{O IV}$$

$$\mathbf{B_{56}} = \begin{array}{c}\left(y_8-z_8+\frac{1}{2}\right)\mathbf{a}_1+\\ \left(x_8-z_8\right)\mathbf{a}_2+\left(x_8+y_8+\frac{1}{2}\right)\mathbf{a}_3\end{array} = ax_8\,\hat{\mathbf{x}}+a\left(y_8+\tfrac{1}{2}\right)\hat{\mathbf{y}}-cz_8\,\hat{\mathbf{z}} \quad (16f) \quad \text{O IV}$$

$$\mathbf{B_{57}} = \begin{array}{c}-\left(x_8+z_8-\frac{1}{2}\right)\mathbf{a}_1+\\ \left(y_8-z_8\right)\mathbf{a}_2-\left(x_8-y_8\right)\mathbf{a}_3\end{array} = a\left(y_8-\tfrac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_8-\tfrac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_8-\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O IV}$$

$$\mathbf{B_{58}} = \begin{array}{c}\left(x_8-z_8+\frac{1}{2}\right)\mathbf{a}_1-\\ \left(y_8+z_8-\frac{1}{2}\right)\mathbf{a}_2+\\ \left(x_8-y_8+\frac{1}{2}\right)\mathbf{a}_3\end{array} = -a\left(y_8-\tfrac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_8+\tfrac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_8-\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O IV}$$

$$\mathbf{B_{59}} = (y_9+z_9)\,\mathbf{a}_1+(x_9+z_9)\,\mathbf{a}_2+(x_9+y_9)\,\mathbf{a}_3 = ax_9\,\hat{\mathbf{x}}+ay_9\,\hat{\mathbf{y}}+cz_9\,\hat{\mathbf{z}} \quad (16f) \quad \text{O V}$$

$$\mathbf{B_{60}} = \left(-y_9+z_9+\tfrac{1}{2}\right)\mathbf{a}_1-(x_9-z_9)\,\mathbf{a}_2-\left(x_9+y_9-\tfrac{1}{2}\right)\mathbf{a}_3 = -ax_9\,\hat{\mathbf{x}}-a\left(y_9-\tfrac{1}{2}\right)\hat{\mathbf{y}}+cz_9\,\hat{\mathbf{z}} \quad (16f) \quad \text{O V}$$

$$\mathbf{B_{61}} = \left(x_9+z_9+\tfrac{1}{2}\right)\mathbf{a}_1-(y_9-z_9)\,\mathbf{a}_2+(x_9-y_9)\,\mathbf{a}_3 = -a\left(y_9+\tfrac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_9+\tfrac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_9+\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O V}$$

$$\mathbf{B_{62}} = \left(-x_9+z_9+\tfrac{1}{2}\right)\mathbf{a}_1+\left(y_9+z_9+\tfrac{1}{2}\right)\mathbf{a}_2+\left(-x_9+y_9+\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_9+\tfrac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_9-\tfrac{1}{4}\right)\hat{\mathbf{y}}+c\left(z_9+\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O V}$$

$$\mathbf{B_{63}} = -(y_9+z_9)\,\mathbf{a}_1-(x_9+z_9)\,\mathbf{a}_2-(x_9+y_9)\,\mathbf{a}_3 = -ax_9\,\hat{\mathbf{x}}-ay_9\,\hat{\mathbf{y}}-cz_9\,\hat{\mathbf{z}} \quad (16f) \quad \text{O V}$$

$$\mathbf{B_{64}} = \left(y_9-z_9+\tfrac{1}{2}\right)\mathbf{a}_1+(x_9-z_9)\,\mathbf{a}_2+\left(x_9+y_9+\tfrac{1}{2}\right)\mathbf{a}_3 = ax_9\,\hat{\mathbf{x}}+a\left(y_9+\tfrac{1}{2}\right)\hat{\mathbf{y}}-cz_9\,\hat{\mathbf{z}} \quad (16f) \quad \text{O V}$$

$$\mathbf{B_{65}} = -\left(x_9+z_9-\tfrac{1}{2}\right)\mathbf{a}_1+(y_9-z_9)\,\mathbf{a}_2-(x_9-y_9)\,\mathbf{a}_3 = a\left(y_9-\tfrac{1}{4}\right)\hat{\mathbf{x}}-a\left(x_9-\tfrac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_9-\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O V}$$

$$\mathbf{B_{66}} = \left(x_9-z_9+\tfrac{1}{2}\right)\mathbf{a}_1-\left(y_9+z_9-\tfrac{1}{2}\right)\mathbf{a}_2+\left(x_9-y_9+\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_9-\tfrac{1}{4}\right)\hat{\mathbf{x}}+a\left(x_9+\tfrac{1}{4}\right)\hat{\mathbf{y}}-c\left(z_9-\tfrac{1}{4}\right)\hat{\mathbf{z}} \quad (16f) \quad \text{O V}$$

References

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