Sr(OH)$_2$(H$_2$O)$_8$ Structure: A18B10C_tP116_130_2c4g_2c2g_a-001
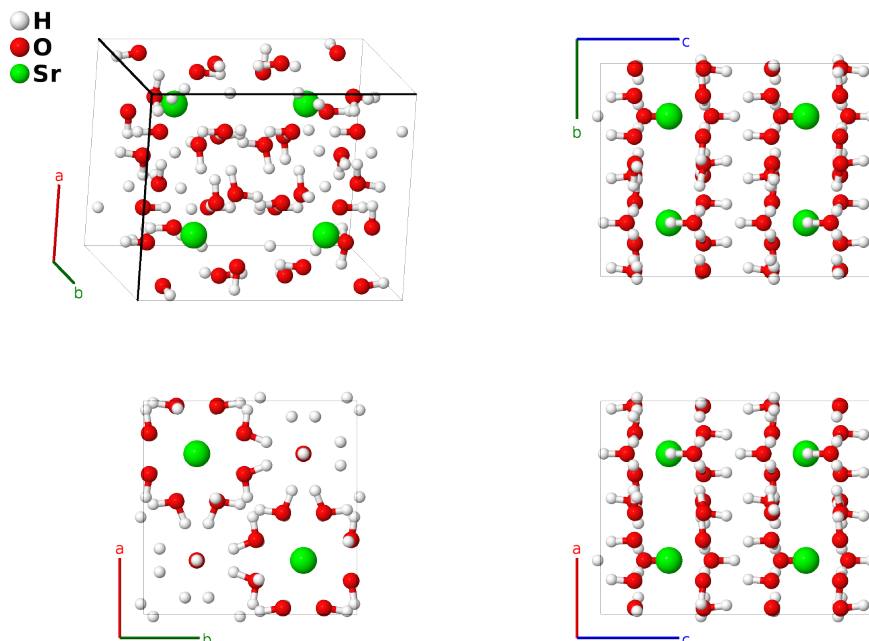
This structure originally had the label `A18B10C_tP116_130_2c4g_2c2g_a`. Calls to that address will be redirected here.

https://aflow.org/p/JDN7

https://aflow.org/p/A18B10C_tP116_130_2c4g_2c2g_a-001

| Prototype	H$_{18}$O$_{10}$Sr
AFLOW prototype label	A18B10C_tP116_130_2c4g_2c2g_a-001
ICSD	170827
Pearson symbol	tP116
Space group number	130
Space group symbol	$P4/ncc$
AFLOW prototype command	aflow --proto=A18B10C_tP116_130_2c4g_2c2g_a-001 --params=$a, c/a, z_2, z_3, z_4, z_5, x_6, y_6, z_6, x_7, y_7, z_7, x_8, y_8, z_8, x_9, y_9, z_9, x_{10}, y_{10}, z_{10}, x_{11}, y_{11}, z_{11}$

- This determination of the crystal structure of Sr(OH)$_2$(H$_2$O)$_8$ improves upon the the structure found by (Natta, 1928), which was given the *Strukturbericht* designation $E6_1$ by (Hermann, 1937). The new structure quadruples the size of the unit cell, locates the hydrogen atoms, and changes the space group.

- We use the data taken by (Ricci, 2005) at 20K.

Simple Tetragonal primitive vectors

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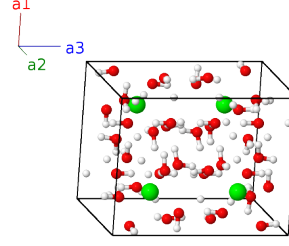
Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_1}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + \frac{1}{4}\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(4a)	Sr I
$\mathbf{B_2}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} + \frac{1}{4}\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(4a)	Sr I
$\mathbf{B_3}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} + \frac{3}{4}\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{3}{4}c\,\hat{\mathbf{z}}$	(4a)	Sr I
$\mathbf{B_4}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + \frac{3}{4}\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{3}{4}c\,\hat{\mathbf{z}}$	(4a)	Sr I
$\mathbf{B_5}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + z_2\,\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + cz_2\,\hat{\mathbf{z}}$	(4c)	H I
$\mathbf{B_6}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} - \left(z_2 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} - c\left(z_2 - \frac{1}{2}\right)\hat{\mathbf{z}}$	(4c)	H I
$\mathbf{B_7}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} - z_2\,\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} - cz_2\,\hat{\mathbf{z}}$	(4c)	H I
$\mathbf{B_8}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + \left(z_2 + \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + c\left(z_2 + \frac{1}{2}\right)\hat{\mathbf{z}}$	(4c)	H I
$\mathbf{B_9}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + z_3\,\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + cz_3\,\hat{\mathbf{z}}$	(4c)	H II
$\mathbf{B_{10}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} - \left(z_3 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} - c\left(z_3 - \frac{1}{2}\right)\hat{\mathbf{z}}$	(4c)	H II
$\mathbf{B_{11}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} - z_3\,\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} - cz_3\,\hat{\mathbf{z}}$	(4c)	H II
$\mathbf{B_{12}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + \left(z_3 + \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + c\left(z_3 + \frac{1}{2}\right)\hat{\mathbf{z}}$	(4c)	H II
$\mathbf{B_{13}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + z_4\,\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + cz_4\,\hat{\mathbf{z}}$	(4c)	O I
$\mathbf{B_{14}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} - \left(z_4 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} - c\left(z_4 - \frac{1}{2}\right)\hat{\mathbf{z}}$	(4c)	O I
$\mathbf{B_{15}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} - z_4\,\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} - cz_4\,\hat{\mathbf{z}}$	(4c)	O I
$\mathbf{B_{16}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + \left(z_4 + \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + c\left(z_4 + \frac{1}{2}\right)\hat{\mathbf{z}}$	(4c)	O I
$\mathbf{B_{17}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + z_5\,\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + cz_5\,\hat{\mathbf{z}}$	(4c)	O II
$\mathbf{B_{18}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} - \left(z_5 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} - c\left(z_5 - \frac{1}{2}\right)\hat{\mathbf{z}}$	(4c)	O II
$\mathbf{B_{19}}$	$=$	$\frac{3}{4}\mathbf{a_1} + \frac{3}{4}\mathbf{a_2} - z_5\,\mathbf{a_3}$	$=$	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} - cz_5\,\hat{\mathbf{z}}$	(4c)	O II
$\mathbf{B_{20}}$	$=$	$\frac{1}{4}\mathbf{a_1} + \frac{1}{4}\mathbf{a_2} + \left(z_5 + \frac{1}{2}\right)\mathbf{a_3}$	$=$	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + c\left(z_5 + \frac{1}{2}\right)\hat{\mathbf{z}}$	(4c)	O II
$\mathbf{B_{21}}$	$=$	$x_6\,\mathbf{a_1} + y_6\,\mathbf{a_2} + z_6\,\mathbf{a_3}$	$=$	$ax_6\,\hat{\mathbf{x}} + ay_6\,\hat{\mathbf{y}} + cz_6\,\hat{\mathbf{z}}$	(16g)	H III
$\mathbf{B_{22}}$	$=$	$-\left(x_6 - \frac{1}{2}\right)\mathbf{a_1} - \left(y_6 - \frac{1}{2}\right)\mathbf{a_2} + z_6\,\mathbf{a_3}$	$=$	$-a\left(x_6 - \frac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_6 - \frac{1}{2}\right)\hat{\mathbf{y}} + cz_6\,\hat{\mathbf{z}}$	(16g)	H III
$\mathbf{B_{23}}$	$=$	$-\left(y_6 - \frac{1}{2}\right)\mathbf{a_1} + x_6\,\mathbf{a_2} + z_6\,\mathbf{a_3}$	$=$	$-a\left(y_6 - \frac{1}{2}\right)\hat{\mathbf{x}} + ax_6\,\hat{\mathbf{y}} + cz_6\,\hat{\mathbf{z}}$	(16g)	H III
$\mathbf{B_{24}}$	$=$	$y_6\,\mathbf{a_1} - \left(x_6 - \frac{1}{2}\right)\mathbf{a_2} + z_6\,\mathbf{a_3}$	$=$	$ay_6\,\hat{\mathbf{x}} - a\left(x_6 - \frac{1}{2}\right)\hat{\mathbf{y}} + cz_6\,\hat{\mathbf{z}}$	(16g)	H III
$\mathbf{B_{25}}$	$=$	$-x_6\,\mathbf{a_1} + \left(y_6 + \frac{1}{2}\right)\mathbf{a_2} - \left(z_6 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$-ax_6\,\hat{\mathbf{x}} + a\left(y_6 + \frac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_6 - \frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	H III
$\mathbf{B_{26}}$	$=$	$\left(x_6 + \frac{1}{2}\right)\mathbf{a_1} - y_6\,\mathbf{a_2} - \left(z_6 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$a\left(x_6 + \frac{1}{2}\right)\hat{\mathbf{x}} - ay_6\,\hat{\mathbf{y}} - c\left(z_6 - \frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	H III
$\mathbf{B_{27}}$	$=$	$\left(y_6 + \frac{1}{2}\right)\mathbf{a_1} + \left(x_6 + \frac{1}{2}\right)\mathbf{a_2} - \left(z_6 - \frac{1}{2}\right)\mathbf{a_3}$	$=$	$a\left(y_6 + \frac{1}{2}\right)\hat{\mathbf{x}} + a\left(x_6 + \frac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_6 - \frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	H III

$$\mathbf{B_{28}} = -y_6\,\mathbf{a}_1 - x_6\,\mathbf{a}_2 - \left(z_6 - \tfrac{1}{2}\right)\mathbf{a}_3 = -ay_6\,\hat{\mathbf{x}} - ax_6\,\hat{\mathbf{y}} - c\left(z_6 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H III}$$

$$\mathbf{B_{29}} = -x_6\,\mathbf{a}_1 - y_6\,\mathbf{a}_2 - z_6\,\mathbf{a}_3 = -ax_6\,\hat{\mathbf{x}} - ay_6\,\hat{\mathbf{y}} - cz_6\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H III}$$

$$\mathbf{B_{30}} = \left(x_6 + \tfrac{1}{2}\right)\mathbf{a}_1 + \left(y_6 + \tfrac{1}{2}\right)\mathbf{a}_2 - z_6\,\mathbf{a}_3 = a\left(x_6 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_6 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - cz_6\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H III}$$

$$\mathbf{B_{31}} = \left(y_6 + \tfrac{1}{2}\right)\mathbf{a}_1 - x_6\,\mathbf{a}_2 - z_6\,\mathbf{a}_3 = a\left(y_6 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ax_6\,\hat{\mathbf{y}} - cz_6\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H III}$$

$$\mathbf{B_{32}} = -y_6\,\mathbf{a}_1 + \left(x_6 + \tfrac{1}{2}\right)\mathbf{a}_2 - z_6\,\mathbf{a}_3 = -ay_6\,\hat{\mathbf{x}} + a\left(x_6 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - cz_6\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H III}$$

$$\mathbf{B_{33}} = x_6\,\mathbf{a}_1 - \left(y_6 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_6 + \tfrac{1}{2}\right)\mathbf{a}_3 = ax_6\,\hat{\mathbf{x}} - a\left(y_6 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_6 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H III}$$

$$\mathbf{B_{34}} = -\left(x_6 - \tfrac{1}{2}\right)\mathbf{a}_1 + y_6\,\mathbf{a}_2 + \left(z_6 + \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_6 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ay_6\,\hat{\mathbf{y}} + c\left(z_6 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H III}$$

$$\mathbf{B_{35}} = -\left(y_6 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(x_6 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_6 + \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_6 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(x_6 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_6 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H III}$$

$$\mathbf{B_{36}} = y_6\,\mathbf{a}_1 + x_6\,\mathbf{a}_2 + \left(z_6 + \tfrac{1}{2}\right)\mathbf{a}_3 = ay_6\,\hat{\mathbf{x}} + ax_6\,\hat{\mathbf{y}} + c\left(z_6 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H III}$$

$$\mathbf{B_{37}} = x_7\,\mathbf{a}_1 + y_7\,\mathbf{a}_2 + z_7\,\mathbf{a}_3 = ax_7\,\hat{\mathbf{x}} + ay_7\,\hat{\mathbf{y}} + cz_7\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{38}} = -\left(x_7 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(y_7 - \tfrac{1}{2}\right)\mathbf{a}_2 + z_7\,\mathbf{a}_3 = -a\left(x_7 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_7 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + cz_7\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{39}} = -\left(y_7 - \tfrac{1}{2}\right)\mathbf{a}_1 + x_7\,\mathbf{a}_2 + z_7\,\mathbf{a}_3 = -a\left(y_7 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ax_7\,\hat{\mathbf{y}} + cz_7\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{40}} = y_7\,\mathbf{a}_1 - \left(x_7 - \tfrac{1}{2}\right)\mathbf{a}_2 + z_7\,\mathbf{a}_3 = ay_7\,\hat{\mathbf{x}} - a\left(x_7 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + cz_7\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{41}} = -x_7\,\mathbf{a}_1 + \left(y_7 + \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_7 - \tfrac{1}{2}\right)\mathbf{a}_3 = -ax_7\,\hat{\mathbf{x}} + a\left(y_7 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_7 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{42}} = \left(x_7 + \tfrac{1}{2}\right)\mathbf{a}_1 - y_7\,\mathbf{a}_2 - \left(z_7 - \tfrac{1}{2}\right)\mathbf{a}_3 = a\left(x_7 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ay_7\,\hat{\mathbf{y}} - c\left(z_7 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{43}} = \left(y_7 + \tfrac{1}{2}\right)\mathbf{a}_1 + \left(x_7 + \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_7 - \tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_7 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(x_7 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_7 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{44}} = -y_7\,\mathbf{a}_1 - x_7\,\mathbf{a}_2 - \left(z_7 - \tfrac{1}{2}\right)\mathbf{a}_3 = -ay_7\,\hat{\mathbf{x}} - ax_7\,\hat{\mathbf{y}} - c\left(z_7 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{45}} = -x_7\,\mathbf{a}_1 - y_7\,\mathbf{a}_2 - z_7\,\mathbf{a}_3 = -ax_7\,\hat{\mathbf{x}} - ay_7\,\hat{\mathbf{y}} - cz_7\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{46}} = \left(x_7 + \tfrac{1}{2}\right)\mathbf{a}_1 + \left(y_7 + \tfrac{1}{2}\right)\mathbf{a}_2 - z_7\,\mathbf{a}_3 = a\left(x_7 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_7 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - cz_7\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{47}} = \left(y_7 + \tfrac{1}{2}\right)\mathbf{a}_1 - x_7\,\mathbf{a}_2 - z_7\,\mathbf{a}_3 = a\left(y_7 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ax_7\,\hat{\mathbf{y}} - cz_7\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{48}} = -y_7\,\mathbf{a}_1 + \left(x_7 + \tfrac{1}{2}\right)\mathbf{a}_2 - z_7\,\mathbf{a}_3 = -ay_7\,\hat{\mathbf{x}} + a\left(x_7 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - cz_7\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{49}} = x_7\,\mathbf{a}_1 - \left(y_7 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_7 + \tfrac{1}{2}\right)\mathbf{a}_3 = ax_7\,\hat{\mathbf{x}} - a\left(y_7 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_7 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{50}} = -\left(x_7 - \tfrac{1}{2}\right)\mathbf{a}_1 + y_7\,\mathbf{a}_2 + \left(z_7 + \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_7 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ay_7\,\hat{\mathbf{y}} + c\left(z_7 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{51}} = -\left(y_7 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(x_7 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_7 + \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_7 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(x_7 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_7 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{52}} = y_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 + \left(z_7 + \tfrac{1}{2}\right)\mathbf{a}_3 = ay_7\,\hat{\mathbf{x}} + ax_7\,\hat{\mathbf{y}} + c\left(z_7 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H IV}$$

$$\mathbf{B_{53}} = x_8\,\mathbf{a}_1 + y_8\,\mathbf{a}_2 + z_8\,\mathbf{a}_3 = ax_8\,\hat{\mathbf{x}} + ay_8\,\hat{\mathbf{y}} + cz_8\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{54}} = -\left(x_8 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(y_8 - \tfrac{1}{2}\right)\mathbf{a}_2 + z_8\,\mathbf{a}_3 = -a\left(x_8 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_8 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + cz_8\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{55}} = -\left(y_8 - \tfrac{1}{2}\right)\mathbf{a}_1 + x_8\,\mathbf{a}_2 + z_8\,\mathbf{a}_3 = -a\left(y_8 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ax_8\,\hat{\mathbf{y}} + cz_8\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{56}} = y_8\,\mathbf{a}_1 - \left(x_8 - \tfrac{1}{2}\right)\mathbf{a}_2 + z_8\,\mathbf{a}_3 = ay_8\,\hat{\mathbf{x}} - a\left(x_8 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + cz_8\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{57}} = -x_8\,\mathbf{a}_1 + \left(y_8 + \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_8 - \tfrac{1}{2}\right)\mathbf{a}_3 = -ax_8\,\hat{\mathbf{x}} + a\left(y_8 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_8 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{58}} = \left(x_8 + \tfrac{1}{2}\right)\mathbf{a}_1 - y_8\,\mathbf{a}_2 - \left(z_8 - \tfrac{1}{2}\right)\mathbf{a}_3 = a\left(x_8 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ay_8\,\hat{\mathbf{y}} - c\left(z_8 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{59}} = \left(y_8 + \tfrac{1}{2}\right)\mathbf{a}_1 + \left(x_8 + \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_8 - \tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_8 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(x_8 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_8 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{60}} = -y_8\,\mathbf{a}_1 - x_8\,\mathbf{a}_2 - \left(z_8 - \tfrac{1}{2}\right)\mathbf{a}_3 = -ay_8\,\hat{\mathbf{x}} - ax_8\,\hat{\mathbf{y}} - c\left(z_8 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{61}} = -x_8\,\mathbf{a}_1 - y_8\,\mathbf{a}_2 - z_8\,\mathbf{a}_3 = -ax_8\,\hat{\mathbf{x}} - ay_8\,\hat{\mathbf{y}} - cz_8\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{62}} = \left(x_8 + \tfrac{1}{2}\right)\mathbf{a}_1 + \left(y_8 + \tfrac{1}{2}\right)\mathbf{a}_2 - z_8\,\mathbf{a}_3 = a\left(x_8 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_8 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - cz_8\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{63}} = \left(y_8 + \tfrac{1}{2}\right)\mathbf{a}_1 - x_8\,\mathbf{a}_2 - z_8\,\mathbf{a}_3 = a\left(y_8 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ax_8\,\hat{\mathbf{y}} - cz_8\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{64}} = -y_8\,\mathbf{a}_1 + \left(x_8 + \tfrac{1}{2}\right)\mathbf{a}_2 - z_8\,\mathbf{a}_3 = -ay_8\,\hat{\mathbf{x}} + a\left(x_8 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - cz_8\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{65}} = x_8\,\mathbf{a}_1 - \left(y_8 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_8 + \tfrac{1}{2}\right)\mathbf{a}_3 = ax_8\,\hat{\mathbf{x}} - a\left(y_8 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_8 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{66}} = -\left(x_8 - \tfrac{1}{2}\right)\mathbf{a}_1 + y_8\,\mathbf{a}_2 + \left(z_8 + \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_8 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ay_8\,\hat{\mathbf{y}} + c\left(z_8 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{67}} = -\left(y_8 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(x_8 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_8 + \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_8 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(x_8 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_8 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{68}} = y_8\,\mathbf{a}_1 + x_8\,\mathbf{a}_2 + \left(z_8 + \tfrac{1}{2}\right)\mathbf{a}_3 = ay_8\,\hat{\mathbf{x}} + ax_8\,\hat{\mathbf{y}} + c\left(z_8 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H V}$$

$$\mathbf{B_{69}} = x_9\,\mathbf{a}_1 + y_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3 = ax_9\,\hat{\mathbf{x}} + ay_9\,\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{70}} = -\left(x_9 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(y_9 - \tfrac{1}{2}\right)\mathbf{a}_2 + z_9\,\mathbf{a}_3 = -a\left(x_9 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_9 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{71}} = -\left(y_9 - \tfrac{1}{2}\right)\mathbf{a}_1 + x_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3 = -a\left(y_9 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ax_9\,\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{72}} = y_9\,\mathbf{a}_1 - \left(x_9 - \tfrac{1}{2}\right)\mathbf{a}_2 + z_9\,\mathbf{a}_3 = ay_9\,\hat{\mathbf{x}} - a\left(x_9 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{73}} = -x_9\,\mathbf{a}_1 + \left(y_9 + \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_9 - \tfrac{1}{2}\right)\mathbf{a}_3 = -ax_9\,\hat{\mathbf{x}} + a\left(y_9 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_9 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{74}} = \left(x_9 + \tfrac{1}{2}\right)\mathbf{a}_1 - y_9\,\mathbf{a}_2 - \left(z_9 - \tfrac{1}{2}\right)\mathbf{a}_3 = a\left(x_9 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ay_9\,\hat{\mathbf{y}} - c\left(z_9 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{75}} = \left(y_9 + \tfrac{1}{2}\right)\mathbf{a}_1 + \left(x_9 + \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_9 - \tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_9 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(x_9 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_9 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{76}} = -y_9\,\mathbf{a}_1 - x_9\,\mathbf{a}_2 - \left(z_9 - \tfrac{1}{2}\right)\mathbf{a}_3 = -ay_9\,\hat{\mathbf{x}} - ax_9\,\hat{\mathbf{y}} - c\left(z_9 - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{77}} = -x_9\,\mathbf{a}_1 - y_9\,\mathbf{a}_2 - z_9\,\mathbf{a}_3 = -ax_9\,\hat{\mathbf{x}} - ay_9\,\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{78}} = \left(x_9 + \tfrac{1}{2}\right)\mathbf{a}_1 + \left(y_9 + \tfrac{1}{2}\right)\mathbf{a}_2 - z_9\,\mathbf{a}_3 = a\left(x_9 + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_9 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{79}} = \left(y_9 + \tfrac{1}{2}\right)\mathbf{a}_1 - x_9\,\mathbf{a}_2 - z_9\,\mathbf{a}_3 = a\left(y_9 + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ax_9\,\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{80}} = -y_9\,\mathbf{a}_1 + \left(x_9 + \tfrac{1}{2}\right)\mathbf{a}_2 - z_9\,\mathbf{a}_3 = -ay_9\,\hat{\mathbf{x}} + a\left(x_9 + \tfrac{1}{2}\right)\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{81}} = x_9\,\mathbf{a}_1 - \left(y_9 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_9 + \tfrac{1}{2}\right)\mathbf{a}_3 = ax_9\,\hat{\mathbf{x}} - a\left(y_9 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_9 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{82}} = -\left(x_9 - \tfrac{1}{2}\right)\mathbf{a}_1 + y_9\,\mathbf{a}_2 + \left(z_9 + \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_9 - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ay_9\,\hat{\mathbf{y}} + c\left(z_9 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{83}} = -\left(y_9 - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(x_9 - \tfrac{1}{2}\right)\mathbf{a}_2 + \left(z_9 + \tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_9 - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(x_9 - \tfrac{1}{2}\right)\hat{\mathbf{y}} + c\left(z_9 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{84}} = y_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 + \left(z_9 + \tfrac{1}{2}\right)\mathbf{a}_3 = ay_9\,\hat{\mathbf{x}} + ax_9\,\hat{\mathbf{y}} + c\left(z_9 + \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{H VI}$$

$$\mathbf{B_{85}} = x_{10}\,\mathbf{a}_1 + y_{10}\,\mathbf{a}_2 + z_{10}\,\mathbf{a}_3 = ax_{10}\,\hat{\mathbf{x}} + ay_{10}\,\hat{\mathbf{y}} + cz_{10}\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{O III}$$

$$\mathbf{B_{86}} = -\left(x_{10} - \tfrac{1}{2}\right)\mathbf{a}_1 - \left(y_{10} - \tfrac{1}{2}\right)\mathbf{a}_2 + z_{10}\,\mathbf{a}_3 = -a\left(x_{10} - \tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_{10} - \tfrac{1}{2}\right)\hat{\mathbf{y}} + cz_{10}\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{O III}$$

$$\mathbf{B_{87}} = -\left(y_{10} - \tfrac{1}{2}\right)\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 + z_{10}\,\mathbf{a}_3 = -a\left(y_{10} - \tfrac{1}{2}\right)\hat{\mathbf{x}} + ax_{10}\,\hat{\mathbf{y}} + cz_{10}\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{O III}$$

$$\mathbf{B_{88}} = y_{10}\,\mathbf{a}_1 - \left(x_{10} - \tfrac{1}{2}\right)\mathbf{a}_2 + z_{10}\,\mathbf{a}_3 = ay_{10}\,\hat{\mathbf{x}} - a\left(x_{10} - \tfrac{1}{2}\right)\hat{\mathbf{y}} + cz_{10}\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{O III}$$

$$\mathbf{B_{89}} = -x_{10}\,\mathbf{a}_1 + \left(y_{10} + \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_{10} - \tfrac{1}{2}\right)\mathbf{a}_3 = -ax_{10}\,\hat{\mathbf{x}} + a\left(y_{10} + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_{10} - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{O III}$$

$$\mathbf{B_{90}} = \left(x_{10} + \tfrac{1}{2}\right)\mathbf{a}_1 - y_{10}\,\mathbf{a}_2 - \left(z_{10} - \tfrac{1}{2}\right)\mathbf{a}_3 = a\left(x_{10} + \tfrac{1}{2}\right)\hat{\mathbf{x}} - ay_{10}\,\hat{\mathbf{y}} - c\left(z_{10} - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{O III}$$

$$\mathbf{B_{91}} = \left(y_{10} + \tfrac{1}{2}\right)\mathbf{a}_1 + \left(x_{10} + \tfrac{1}{2}\right)\mathbf{a}_2 - \left(z_{10} - \tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_{10} + \tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(x_{10} + \tfrac{1}{2}\right)\hat{\mathbf{y}} - c\left(z_{10} - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{O III}$$

$$\mathbf{B_{92}} = -y_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 - \left(z_{10} - \tfrac{1}{2}\right)\mathbf{a}_3 = -ay_{10}\,\hat{\mathbf{x}} - ax_{10}\,\hat{\mathbf{y}} - c\left(z_{10} - \tfrac{1}{2}\right)\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{O III}$$

$$\mathbf{B_{93}} = -x_{10}\,\mathbf{a}_1 - y_{10}\,\mathbf{a}_2 - z_{10}\,\mathbf{a}_3 = -ax_{10}\,\hat{\mathbf{x}} - ay_{10}\,\hat{\mathbf{y}} - cz_{10}\,\hat{\mathbf{z}} \qquad (16\text{g}) \qquad \text{O III}$$

$\mathbf{B_{94}}$	$=$	$\left(x_{10}+\frac{1}{2}\right)\mathbf{a}_1+\left(y_{10}+\frac{1}{2}\right)\mathbf{a}_2-z_{10}\mathbf{a}_3$	$=$	$a\left(x_{10}+\frac{1}{2}\right)\hat{\mathbf{x}}+a\left(y_{10}+\frac{1}{2}\right)\hat{\mathbf{y}}-cz_{10}\hat{\mathbf{z}}$	(16g)	O III
$\mathbf{B_{95}}$	$=$	$\left(y_{10}+\frac{1}{2}\right)\mathbf{a}_1-x_{10}\mathbf{a}_2-z_{10}\mathbf{a}_3$	$=$	$a\left(y_{10}+\frac{1}{2}\right)\hat{\mathbf{x}}-ax_{10}\hat{\mathbf{y}}-cz_{10}\hat{\mathbf{z}}$	(16g)	O III
$\mathbf{B_{96}}$	$=$	$-y_{10}\mathbf{a}_1+\left(x_{10}+\frac{1}{2}\right)\mathbf{a}_2-z_{10}\mathbf{a}_3$	$=$	$-ay_{10}\hat{\mathbf{x}}+a\left(x_{10}+\frac{1}{2}\right)\hat{\mathbf{y}}-cz_{10}\hat{\mathbf{z}}$	(16g)	O III
$\mathbf{B_{97}}$	$=$	$x_{10}\mathbf{a}_1-\left(y_{10}-\frac{1}{2}\right)\mathbf{a}_2+\left(z_{10}+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$ax_{10}\hat{\mathbf{x}}-a\left(y_{10}-\frac{1}{2}\right)\hat{\mathbf{y}}+c\left(z_{10}+\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O III
$\mathbf{B_{98}}$	$=$	$-\left(x_{10}-\frac{1}{2}\right)\mathbf{a}_1+y_{10}\mathbf{a}_2+\left(z_{10}+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-a\left(x_{10}-\frac{1}{2}\right)\hat{\mathbf{x}}+ay_{10}\hat{\mathbf{y}}+c\left(z_{10}+\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O III
$\mathbf{B_{99}}$	$=$	$-\left(y_{10}-\frac{1}{2}\right)\mathbf{a}_1-\left(x_{10}-\frac{1}{2}\right)\mathbf{a}_2+\left(z_{10}+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-a\left(y_{10}-\frac{1}{2}\right)\hat{\mathbf{x}}-a\left(x_{10}-\frac{1}{2}\right)\hat{\mathbf{y}}+c\left(z_{10}+\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O III
$\mathbf{B_{100}}$	$=$	$y_{10}\mathbf{a}_1+x_{10}\mathbf{a}_2+\left(z_{10}+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$ay_{10}\hat{\mathbf{x}}+ax_{10}\hat{\mathbf{y}}+c\left(z_{10}+\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O III
$\mathbf{B_{101}}$	$=$	$x_{11}\mathbf{a}_1+y_{11}\mathbf{a}_2+z_{11}\mathbf{a}_3$	$=$	$ax_{11}\hat{\mathbf{x}}+ay_{11}\hat{\mathbf{y}}+cz_{11}\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{102}}$	$=$	$-\left(x_{11}-\frac{1}{2}\right)\mathbf{a}_1-\left(y_{11}-\frac{1}{2}\right)\mathbf{a}_2+z_{11}\mathbf{a}_3$	$=$	$-a\left(x_{11}-\frac{1}{2}\right)\hat{\mathbf{x}}-a\left(y_{11}-\frac{1}{2}\right)\hat{\mathbf{y}}+cz_{11}\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{103}}$	$=$	$-\left(y_{11}-\frac{1}{2}\right)\mathbf{a}_1+x_{11}\mathbf{a}_2+z_{11}\mathbf{a}_3$	$=$	$-a\left(y_{11}-\frac{1}{2}\right)\hat{\mathbf{x}}+ax_{11}\hat{\mathbf{y}}+cz_{11}\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{104}}$	$=$	$y_{11}\mathbf{a}_1-\left(x_{11}-\frac{1}{2}\right)\mathbf{a}_2+z_{11}\mathbf{a}_3$	$=$	$ay_{11}\hat{\mathbf{x}}-a\left(x_{11}-\frac{1}{2}\right)\hat{\mathbf{y}}+cz_{11}\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{105}}$	$=$	$-x_{11}\mathbf{a}_1+\left(y_{11}+\frac{1}{2}\right)\mathbf{a}_2-\left(z_{11}-\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-ax_{11}\hat{\mathbf{x}}+a\left(y_{11}+\frac{1}{2}\right)\hat{\mathbf{y}}-c\left(z_{11}-\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{106}}$	$=$	$\left(x_{11}+\frac{1}{2}\right)\mathbf{a}_1-y_{11}\mathbf{a}_2-\left(z_{11}-\frac{1}{2}\right)\mathbf{a}_3$	$=$	$a\left(x_{11}+\frac{1}{2}\right)\hat{\mathbf{x}}-ay_{11}\hat{\mathbf{y}}-c\left(z_{11}-\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{107}}$	$=$	$\left(y_{11}+\frac{1}{2}\right)\mathbf{a}_1+\left(x_{11}+\frac{1}{2}\right)\mathbf{a}_2-\left(z_{11}-\frac{1}{2}\right)\mathbf{a}_3$	$=$	$a\left(y_{11}+\frac{1}{2}\right)\hat{\mathbf{x}}+a\left(x_{11}+\frac{1}{2}\right)\hat{\mathbf{y}}-c\left(z_{11}-\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{108}}$	$=$	$-y_{11}\mathbf{a}_1-x_{11}\mathbf{a}_2-\left(z_{11}-\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-ay_{11}\hat{\mathbf{x}}-ax_{11}\hat{\mathbf{y}}-c\left(z_{11}-\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{109}}$	$=$	$-x_{11}\mathbf{a}_1-y_{11}\mathbf{a}_2-z_{11}\mathbf{a}_3$	$=$	$-ax_{11}\hat{\mathbf{x}}-ay_{11}\hat{\mathbf{y}}-cz_{11}\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{110}}$	$=$	$\left(x_{11}+\frac{1}{2}\right)\mathbf{a}_1+\left(y_{11}+\frac{1}{2}\right)\mathbf{a}_2-z_{11}\mathbf{a}_3$	$=$	$a\left(x_{11}+\frac{1}{2}\right)\hat{\mathbf{x}}+a\left(y_{11}+\frac{1}{2}\right)\hat{\mathbf{y}}-cz_{11}\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{111}}$	$=$	$\left(y_{11}+\frac{1}{2}\right)\mathbf{a}_1-x_{11}\mathbf{a}_2-z_{11}\mathbf{a}_3$	$=$	$a\left(y_{11}+\frac{1}{2}\right)\hat{\mathbf{x}}-ax_{11}\hat{\mathbf{y}}-cz_{11}\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{112}}$	$=$	$-y_{11}\mathbf{a}_1+\left(x_{11}+\frac{1}{2}\right)\mathbf{a}_2-z_{11}\mathbf{a}_3$	$=$	$-ay_{11}\hat{\mathbf{x}}+a\left(x_{11}+\frac{1}{2}\right)\hat{\mathbf{y}}-cz_{11}\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{113}}$	$=$	$x_{11}\mathbf{a}_1-\left(y_{11}-\frac{1}{2}\right)\mathbf{a}_2+\left(z_{11}+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$ax_{11}\hat{\mathbf{x}}-a\left(y_{11}-\frac{1}{2}\right)\hat{\mathbf{y}}+c\left(z_{11}+\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{114}}$	$=$	$-\left(x_{11}-\frac{1}{2}\right)\mathbf{a}_1+y_{11}\mathbf{a}_2+\left(z_{11}+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-a\left(x_{11}-\frac{1}{2}\right)\hat{\mathbf{x}}+ay_{11}\hat{\mathbf{y}}+c\left(z_{11}+\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{115}}$	$=$	$-\left(y_{11}-\frac{1}{2}\right)\mathbf{a}_1-\left(x_{11}-\frac{1}{2}\right)\mathbf{a}_2+\left(z_{11}+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$-a\left(y_{11}-\frac{1}{2}\right)\hat{\mathbf{x}}-a\left(x_{11}-\frac{1}{2}\right)\hat{\mathbf{y}}+c\left(z_{11}+\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O IV
$\mathbf{B_{116}}$	$=$	$y_{11}\mathbf{a}_1+x_{11}\mathbf{a}_2+\left(z_{11}+\frac{1}{2}\right)\mathbf{a}_3$	$=$	$ay_{11}\hat{\mathbf{x}}+ax_{11}\hat{\mathbf{y}}+c\left(z_{11}+\frac{1}{2}\right)\hat{\mathbf{z}}$	(16g)	O IV

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