β-$Hg_3S_2Cl_2$ Structure: A2B3C2_cP224_223_abcdefk_j3k_il-001

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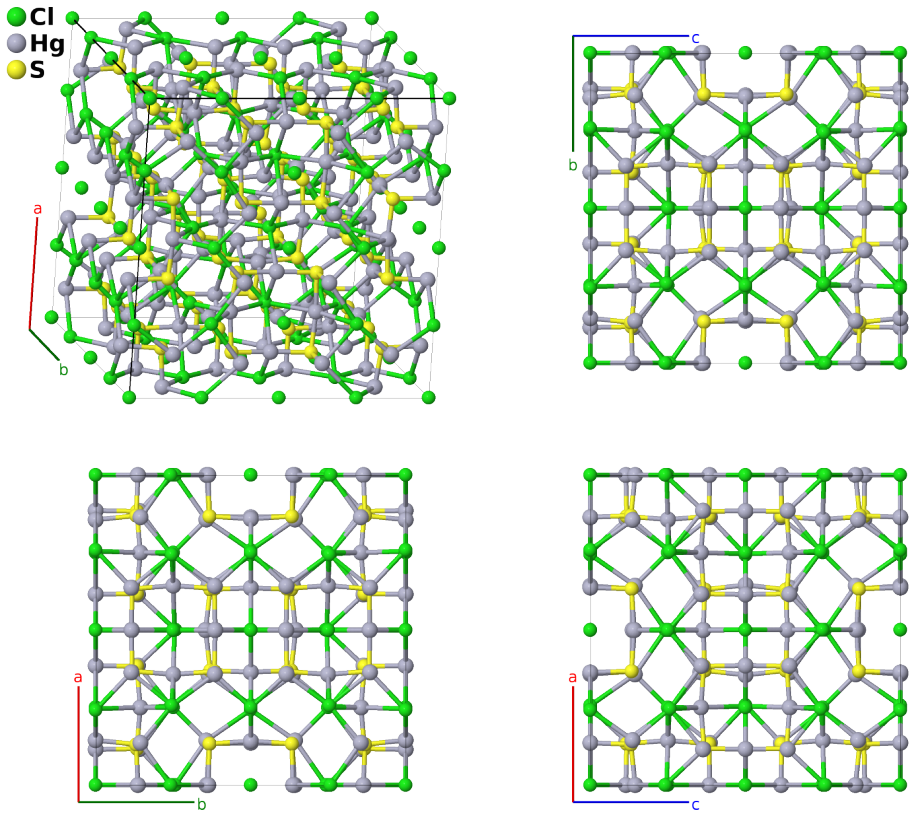
https://aflow.org/p/UWQ4

https://aflow.org/p/A2B3C2_cP224_223_abcdefk_j3k_il-001



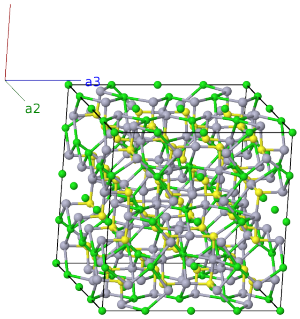
Prototype	$Cl_2Hg_3S_2$
AFLOW prototype label	A2B3C2_cP224_223_abcdefk_j3k_il-001
ICSD	83407
Pearson symbol	cP224
Space group number	223
Space group symbol	$Pm\bar{3}n$
AFLOW prototype command	`aflow --proto=A2B3C2_cP224_223_abcdefk_j3k_il-001 --params=`$a, x_6, x_7, y_8, y_9, z_9, y_{10}, z_{10}, y_{11}, z_{11}, y_{12}, z_{12}, x_{13}, y_{13}, z_{13}$

- $Hg_3Cl_2S_2$ is found in three forms (Carlson, 1967):
  - Corderoite (α-$Hg_3Cl_2S_2$), the cubic ground state.
  - β-$Hg_3Cl_2S_2$, which appears above 340°C, another cubic phase with a much larger unit cell. (this structure)

– Kenhsuite (γ-$Hg_3Cl_2S_2$), which on average has an orthorhombic lattice. This state is apparently metastable.

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	(2a)	Cl I
$\mathbf{B_2}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(2a)	Cl I
$\mathbf{B_3}$	=	$\frac{1}{2}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(6b)	Cl II
$\mathbf{B_4}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(6b)	Cl II
$\mathbf{B_5}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}}$	(6b)	Cl II
$\mathbf{B_6}$	=	$\frac{1}{2}\,\mathbf{a}_2$	=	$\frac{1}{2}a\,\hat{\mathbf{y}}$	(6b)	Cl II
$\mathbf{B_7}$	=	$\frac{1}{2}\,\mathbf{a}_1$	=	$\frac{1}{2}a\,\hat{\mathbf{x}}$	(6b)	Cl II
$\mathbf{B_8}$	=	$\frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{z}}$	(6b)	Cl II
$\mathbf{B_9}$	=	$\frac{1}{4}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(6c)	Cl III
$\mathbf{B_{10}}$	=	$\frac{3}{4}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(6c)	Cl III
$\mathbf{B_{11}}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}}$	(6c)	Cl III
$\mathbf{B_{12}}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_2$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}}$	(6c)	Cl III
$\mathbf{B_{13}}$	=	$\frac{1}{2}\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(6c)	Cl III
$\mathbf{B_{14}}$	=	$\frac{1}{2}\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(6c)	Cl III
$\mathbf{B_{15}}$	=	$\frac{1}{4}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}}$	(6d)	Cl IV
$\mathbf{B_{16}}$	=	$\frac{3}{4}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}}$	(6d)	Cl IV
$\mathbf{B_{17}}$	=	$\frac{1}{4}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(6d)	Cl IV
$\mathbf{B_{18}}$	=	$\frac{3}{4}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{3}{4}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(6d)	Cl IV
$\mathbf{B_{19}}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(6d)	Cl IV
$\mathbf{B_{20}}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(6d)	Cl IV
$\mathbf{B_{21}}$	=	$\frac{1}{4}\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(8e)	Cl V
$\mathbf{B_{22}}$	=	$\frac{3}{4}\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(8e)	Cl V
$\mathbf{B_{23}}$	=	$\frac{3}{4}\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(8e)	Cl V
$\mathbf{B_{24}}$	=	$\frac{1}{4}\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(8e)	Cl V
$\mathbf{B_{25}}$	=	$\frac{3}{4}\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(8e)	Cl V
$\mathbf{B_{26}}$	=	$\frac{1}{4}\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{3}{4}a\,\hat{\mathbf{z}}$	(8e)	Cl V
$\mathbf{B_{27}}$	=	$\frac{1}{4}\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(8e)	Cl V

$\mathbf{B_{28}}$	=	$\frac{3}{4}\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(8e)	Cl V
$\mathbf{B_{29}}$	=	$x_6\,\mathbf{a}_1$	=	$ax_6\,\hat{\mathbf{x}}$	(12f)	Cl VI
$\mathbf{B_{30}}$	=	$-x_6\,\mathbf{a}_1$	=	$-ax_6\,\hat{\mathbf{x}}$	(12f)	Cl VI
$\mathbf{B_{31}}$	=	$x_6\,\mathbf{a}_2$	=	$ax_6\,\hat{\mathbf{y}}$	(12f)	Cl VI
$\mathbf{B_{32}}$	=	$-x_6\,\mathbf{a}_2$	=	$-ax_6\,\hat{\mathbf{y}}$	(12f)	Cl VI
$\mathbf{B_{33}}$	=	$x_6\,\mathbf{a}_3$	=	$ax_6\,\hat{\mathbf{z}}$	(12f)	Cl VI
$\mathbf{B_{34}}$	=	$-x_6\,\mathbf{a}_3$	=	$-ax_6\,\hat{\mathbf{z}}$	(12f)	Cl VI
$\mathbf{B_{35}}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \left(x_6 + \frac{1}{2}\right)\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + a\left(x_6 + \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(12f)	Cl VI
$\mathbf{B_{36}}$	=	$\frac{1}{2}\,\mathbf{a}_1 - \left(x_6 - \frac{1}{2}\right)\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} - a\left(x_6 - \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(12f)	Cl VI
$\mathbf{B_{37}}$	=	$\left(x_6 + \frac{1}{2}\right)\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$a\left(x_6 + \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(12f)	Cl VI
$\mathbf{B_{38}}$	=	$-\left(x_6 - \frac{1}{2}\right)\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$-a\left(x_6 - \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(12f)	Cl VI
$\mathbf{B_{39}}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2 - \left(x_6 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} - a\left(x_6 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12f)	Cl VI
$\mathbf{B_{40}}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2 + \left(x_6 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + a\left(x_6 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12f)	Cl VI
$\mathbf{B_{41}}$	=	$x_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 + x_7\,\mathbf{a}_3$	=	$ax_7\,\hat{\mathbf{x}} + ax_7\,\hat{\mathbf{y}} + ax_7\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{42}}$	=	$-x_7\,\mathbf{a}_1 - x_7\,\mathbf{a}_2 + x_7\,\mathbf{a}_3$	=	$-ax_7\,\hat{\mathbf{x}} - ax_7\,\hat{\mathbf{y}} + ax_7\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{43}}$	=	$-x_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 - x_7\,\mathbf{a}_3$	=	$-ax_7\,\hat{\mathbf{x}} + ax_7\,\hat{\mathbf{y}} - ax_7\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{44}}$	=	$x_7\,\mathbf{a}_1 - x_7\,\mathbf{a}_2 - x_7\,\mathbf{a}_3$	=	$ax_7\,\hat{\mathbf{x}} - ax_7\,\hat{\mathbf{y}} - ax_7\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{45}}$	=	$\left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_1 + \left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_2 - \left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{x}} + a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{y}} - a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{46}}$	=	$-\left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_1 - \left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_2 - \left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{x}} - a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{y}} - a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{47}}$	=	$\left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_1 - \left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_2 + \left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{x}} - a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{y}} + a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{48}}$	=	$-\left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_1 + \left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_2 + \left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{x}} + a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{y}} + a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{49}}$	=	$-x_7\,\mathbf{a}_1 - x_7\,\mathbf{a}_2 - x_7\,\mathbf{a}_3$	=	$-ax_7\,\hat{\mathbf{x}} - ax_7\,\hat{\mathbf{y}} - ax_7\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{50}}$	=	$x_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 - x_7\,\mathbf{a}_3$	=	$ax_7\,\hat{\mathbf{x}} + ax_7\,\hat{\mathbf{y}} - ax_7\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{51}}$	=	$x_7\,\mathbf{a}_1 - x_7\,\mathbf{a}_2 + x_7\,\mathbf{a}_3$	=	$ax_7\,\hat{\mathbf{x}} - ax_7\,\hat{\mathbf{y}} + ax_7\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{52}}$	=	$-x_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 + x_7\,\mathbf{a}_3$	=	$-ax_7\,\hat{\mathbf{x}} + ax_7\,\hat{\mathbf{y}} + ax_7\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{53}}$	=	$-\left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_1 - \left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_2 + \left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{x}} - a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{y}} + a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{54}}$	=	$\left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_1 + \left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_2 + \left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{x}} + a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{y}} + a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{55}}$	=	$-\left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_1 + \left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_2 - \left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{x}} + a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{y}} - a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{56}}$	=	$\left(x_7 + \frac{1}{2}\right)\,\mathbf{a}_1 - \left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_2 - \left(x_7 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$a\left(x_7 + \frac{1}{2}\right)\,\hat{\mathbf{x}} - a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{y}} - a\left(x_7 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(16i)	S I
$\mathbf{B_{57}}$	=	$\frac{1}{4}\,\mathbf{a}_1 + y_8\,\mathbf{a}_2 + \left(y_8 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + ay_8\,\hat{\mathbf{y}} + a\left(y_8 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(24j)	Hg I
$\mathbf{B_{58}}$	=	$\frac{3}{4}\,\mathbf{a}_1 - y_8\,\mathbf{a}_2 + \left(y_8 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} - ay_8\,\hat{\mathbf{y}} + a\left(y_8 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(24j)	Hg I
$\mathbf{B_{59}}$	=	$\frac{3}{4}\,\mathbf{a}_1 + y_8\,\mathbf{a}_2 - \left(y_8 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} + ay_8\,\hat{\mathbf{y}} - a\left(y_8 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(24j)	Hg I
$\mathbf{B_{60}}$	=	$\frac{1}{4}\,\mathbf{a}_1 - y_8\,\mathbf{a}_2 - \left(y_8 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} - ay_8\,\hat{\mathbf{y}} - a\left(y_8 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(24j)	Hg I
$\mathbf{B_{61}}$	=	$\left(y_8 + \frac{1}{2}\right)\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2 + y_8\,\mathbf{a}_3$	=	$a\left(y_8 + \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + ay_8\,\hat{\mathbf{z}}$	(24j)	Hg I
$\mathbf{B_{62}}$	=	$\left(y_8 + \frac{1}{2}\right)\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_2 - y_8\,\mathbf{a}_3$	=	$a\left(y_8 + \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} - ay_8\,\hat{\mathbf{z}}$	(24j)	Hg I

$$
\begin{array}{lcccccll}
\mathbf{B_{63}} & = & -\left(y_8-\frac{1}{2}\right)\,\mathbf{a}_1+\frac{3}{4}\,\mathbf{a}_2+y_8\,\mathbf{a}_3 & = & -a\left(y_8-\frac{1}{2}\right)\,\hat{\mathbf{x}}+\frac{3}{4}a\,\hat{\mathbf{y}}+ay_8\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{64}} & = & -\left(y_8-\frac{1}{2}\right)\,\mathbf{a}_1+\frac{1}{4}\,\mathbf{a}_2-y_8\,\mathbf{a}_3 & = & -a\left(y_8-\frac{1}{2}\right)\,\hat{\mathbf{x}}+\frac{1}{4}a\,\hat{\mathbf{y}}-ay_8\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{65}} & = & y_8\,\mathbf{a}_1+\left(y_8+\frac{1}{2}\right)\,\mathbf{a}_2+\frac{1}{4}\,\mathbf{a}_3 & = & ay_8\,\hat{\mathbf{x}}+a\left(y_8+\frac{1}{2}\right)\,\hat{\mathbf{y}}+\frac{1}{4}a\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{66}} & = & -y_8\,\mathbf{a}_1+\left(y_8+\frac{1}{2}\right)\,\mathbf{a}_2+\frac{3}{4}\,\mathbf{a}_3 & = & -ay_8\,\hat{\mathbf{x}}+a\left(y_8+\frac{1}{2}\right)\,\hat{\mathbf{y}}+\frac{3}{4}a\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{67}} & = & y_8\,\mathbf{a}_1-\left(y_8-\frac{1}{2}\right)\,\mathbf{a}_2+\frac{3}{4}\,\mathbf{a}_3 & = & ay_8\,\hat{\mathbf{x}}-a\left(y_8-\frac{1}{2}\right)\,\hat{\mathbf{y}}+\frac{3}{4}a\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{68}} & = & -y_8\,\mathbf{a}_1-\left(y_8-\frac{1}{2}\right)\,\mathbf{a}_2+\frac{1}{4}\,\mathbf{a}_3 & = & -ay_8\,\hat{\mathbf{x}}-a\left(y_8-\frac{1}{2}\right)\,\hat{\mathbf{y}}+\frac{1}{4}a\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{69}} & = & \frac{3}{4}\,\mathbf{a}_1-y_8\,\mathbf{a}_2-\left(y_8-\frac{1}{2}\right)\,\mathbf{a}_3 & = & \frac{3}{4}a\,\hat{\mathbf{x}}-ay_8\,\hat{\mathbf{y}}-a\left(y_8-\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{70}} & = & \frac{1}{4}\,\mathbf{a}_1+y_8\,\mathbf{a}_2-\left(y_8-\frac{1}{2}\right)\,\mathbf{a}_3 & = & \frac{1}{4}a\,\hat{\mathbf{x}}+ay_8\,\hat{\mathbf{y}}-a\left(y_8-\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{71}} & = & \frac{1}{4}\,\mathbf{a}_1-y_8\,\mathbf{a}_2+\left(y_8+\frac{1}{2}\right)\,\mathbf{a}_3 & = & \frac{1}{4}a\,\hat{\mathbf{x}}-ay_8\,\hat{\mathbf{y}}+a\left(y_8+\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{72}} & = & \frac{3}{4}\,\mathbf{a}_1+y_8\,\mathbf{a}_2+\left(y_8+\frac{1}{2}\right)\,\mathbf{a}_3 & = & \frac{3}{4}a\,\hat{\mathbf{x}}+ay_8\,\hat{\mathbf{y}}+a\left(y_8+\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{73}} & = & -\left(y_8-\frac{1}{2}\right)\,\mathbf{a}_1+\frac{3}{4}\,\mathbf{a}_2-y_8\,\mathbf{a}_3 & = & -a\left(y_8-\frac{1}{2}\right)\,\hat{\mathbf{x}}+\frac{3}{4}a\,\hat{\mathbf{y}}-ay_8\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{74}} & = & -\left(y_8-\frac{1}{2}\right)\,\mathbf{a}_1+\frac{1}{4}\,\mathbf{a}_2+y_8\,\mathbf{a}_3 & = & -a\left(y_8-\frac{1}{2}\right)\,\hat{\mathbf{x}}+\frac{1}{4}a\,\hat{\mathbf{y}}+ay_8\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{75}} & = & \left(y_8+\frac{1}{2}\right)\,\mathbf{a}_1+\frac{1}{4}\,\mathbf{a}_2-y_8\,\mathbf{a}_3 & = & a\left(y_8+\frac{1}{2}\right)\,\hat{\mathbf{x}}+\frac{1}{4}a\,\hat{\mathbf{y}}-ay_8\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{76}} & = & \left(y_8+\frac{1}{2}\right)\,\mathbf{a}_1+\frac{3}{4}\,\mathbf{a}_2+y_8\,\mathbf{a}_3 & = & a\left(y_8+\frac{1}{2}\right)\,\hat{\mathbf{x}}+\frac{3}{4}a\,\hat{\mathbf{y}}+ay_8\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{77}} & = & -y_8\,\mathbf{a}_1-\left(y_8-\frac{1}{2}\right)\,\mathbf{a}_2+\frac{3}{4}\,\mathbf{a}_3 & = & -ay_8\,\hat{\mathbf{x}}-a\left(y_8-\frac{1}{2}\right)\,\hat{\mathbf{y}}+\frac{3}{4}a\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{78}} & = & y_8\,\mathbf{a}_1-\left(y_8-\frac{1}{2}\right)\,\mathbf{a}_2+\frac{1}{4}\,\mathbf{a}_3 & = & ay_8\,\hat{\mathbf{x}}-a\left(y_8-\frac{1}{2}\right)\,\hat{\mathbf{y}}+\frac{1}{4}a\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{79}} & = & -y_8\,\mathbf{a}_1+\left(y_8+\frac{1}{2}\right)\,\mathbf{a}_2+\frac{1}{4}\,\mathbf{a}_3 & = & -ay_8\,\hat{\mathbf{x}}+a\left(y_8+\frac{1}{2}\right)\,\hat{\mathbf{y}}+\frac{1}{4}a\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{80}} & = & y_8\,\mathbf{a}_1+\left(y_8+\frac{1}{2}\right)\,\mathbf{a}_2+\frac{3}{4}\,\mathbf{a}_3 & = & ay_8\,\hat{\mathbf{x}}+a\left(y_8+\frac{1}{2}\right)\,\hat{\mathbf{y}}+\frac{3}{4}a\,\hat{\mathbf{z}} & (24j) & \text{Hg I}\\
\mathbf{B_{81}} & = & y_9\,\mathbf{a}_2+z_9\,\mathbf{a}_3 & = & ay_9\,\hat{\mathbf{y}}+az_9\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{82}} & = & -y_9\,\mathbf{a}_2+z_9\,\mathbf{a}_3 & = & -ay_9\,\hat{\mathbf{y}}+az_9\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{83}} & = & y_9\,\mathbf{a}_2-z_9\,\mathbf{a}_3 & = & ay_9\,\hat{\mathbf{y}}-az_9\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{84}} & = & -y_9\,\mathbf{a}_2-z_9\,\mathbf{a}_3 & = & -ay_9\,\hat{\mathbf{y}}-az_9\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{85}} & = & z_9\,\mathbf{a}_1+y_9\,\mathbf{a}_3 & = & az_9\,\hat{\mathbf{x}}+ay_9\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{86}} & = & z_9\,\mathbf{a}_1-y_9\,\mathbf{a}_3 & = & az_9\,\hat{\mathbf{x}}-ay_9\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{87}} & = & -z_9\,\mathbf{a}_1+y_9\,\mathbf{a}_3 & = & -az_9\,\hat{\mathbf{x}}+ay_9\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{88}} & = & -z_9\,\mathbf{a}_1-y_9\,\mathbf{a}_3 & = & -az_9\,\hat{\mathbf{x}}-ay_9\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{89}} & = & y_9\,\mathbf{a}_1+z_9\,\mathbf{a}_2 & = & ay_9\,\hat{\mathbf{x}}+az_9\,\hat{\mathbf{y}} & (24k) & \text{Cl VII}\\
\mathbf{B_{90}} & = & -y_9\,\mathbf{a}_1+z_9\,\mathbf{a}_2 & = & -ay_9\,\hat{\mathbf{x}}+az_9\,\hat{\mathbf{y}} & (24k) & \text{Cl VII}\\
\mathbf{B_{91}} & = & y_9\,\mathbf{a}_1-z_9\,\mathbf{a}_2 & = & ay_9\,\hat{\mathbf{x}}-az_9\,\hat{\mathbf{y}} & (24k) & \text{Cl VII}\\
\mathbf{B_{92}} & = & -y_9\,\mathbf{a}_1-z_9\,\mathbf{a}_2 & = & -ay_9\,\hat{\mathbf{x}}-az_9\,\hat{\mathbf{y}} & (24k) & \text{Cl VII}\\
\mathbf{B_{93}} & = & \left(y_9+\frac{1}{2}\right)\,\mathbf{a}_1+\frac{1}{2}\,\mathbf{a}_2-\left(z_9-\frac{1}{2}\right)\,\mathbf{a}_3 & = & a\left(y_9+\frac{1}{2}\right)\,\hat{\mathbf{x}}+\frac{1}{2}a\,\hat{\mathbf{y}}-a\left(z_9-\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{94}} & = & -\left(y_9-\frac{1}{2}\right)\,\mathbf{a}_1+\frac{1}{2}\,\mathbf{a}_2-\left(z_9-\frac{1}{2}\right)\,\mathbf{a}_3 & = & -a\left(y_9-\frac{1}{2}\right)\,\hat{\mathbf{x}}+\frac{1}{2}a\,\hat{\mathbf{y}}-a\left(z_9-\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{95}} & = & \left(y_9+\frac{1}{2}\right)\,\mathbf{a}_1+\frac{1}{2}\,\mathbf{a}_2+\left(z_9+\frac{1}{2}\right)\,\mathbf{a}_3 & = & a\left(y_9+\frac{1}{2}\right)\,\hat{\mathbf{x}}+\frac{1}{2}a\,\hat{\mathbf{y}}+a\left(z_9+\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{96}} & = & -\left(y_9-\frac{1}{2}\right)\,\mathbf{a}_1+\frac{1}{2}\,\mathbf{a}_2+\left(z_9+\frac{1}{2}\right)\,\mathbf{a}_3 & = & -a\left(y_9-\frac{1}{2}\right)\,\hat{\mathbf{x}}+\frac{1}{2}a\,\hat{\mathbf{y}}+a\left(z_9+\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{97}} & = & \frac{1}{2}\,\mathbf{a}_1+\left(z_9+\frac{1}{2}\right)\,\mathbf{a}_2-\left(y_9-\frac{1}{2}\right)\,\mathbf{a}_3 & = & \frac{1}{2}a\,\hat{\mathbf{x}}+a\left(z_9+\frac{1}{2}\right)\,\hat{\mathbf{y}}-a\left(y_9-\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{98}} & = & \frac{1}{2}\,\mathbf{a}_1+\left(z_9+\frac{1}{2}\right)\,\mathbf{a}_2+\left(y_9+\frac{1}{2}\right)\,\mathbf{a}_3 & = & \frac{1}{2}a\,\hat{\mathbf{x}}+a\left(z_9+\frac{1}{2}\right)\,\hat{\mathbf{y}}+a\left(y_9+\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{99}} & = & \frac{1}{2}\,\mathbf{a}_1-\left(z_9-\frac{1}{2}\right)\,\mathbf{a}_2-\left(y_9-\frac{1}{2}\right)\,\mathbf{a}_3 & = & \frac{1}{2}a\,\hat{\mathbf{x}}-a\left(z_9-\frac{1}{2}\right)\,\hat{\mathbf{y}}-a\left(y_9-\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{100}} & = & \frac{1}{2}\,\mathbf{a}_1-\left(z_9-\frac{1}{2}\right)\,\mathbf{a}_2+\left(y_9+\frac{1}{2}\right)\,\mathbf{a}_3 & = & \frac{1}{2}a\,\hat{\mathbf{x}}-a\left(z_9-\frac{1}{2}\right)\,\hat{\mathbf{y}}+a\left(y_9+\frac{1}{2}\right)\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{101}} & = & \left(z_9+\frac{1}{2}\right)\,\mathbf{a}_1+\left(y_9+\frac{1}{2}\right)\,\mathbf{a}_2+\frac{1}{2}\,\mathbf{a}_3 & = & a\left(z_9+\frac{1}{2}\right)\,\hat{\mathbf{x}}+a\left(y_9+\frac{1}{2}\right)\,\hat{\mathbf{y}}+\frac{1}{2}a\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}\\
\mathbf{B_{102}} & = & \left(z_9+\frac{1}{2}\right)\,\mathbf{a}_1-\left(y_9-\frac{1}{2}\right)\,\mathbf{a}_2+\frac{1}{2}\,\mathbf{a}_3 & = & a\left(z_9+\frac{1}{2}\right)\,\hat{\mathbf{x}}-a\left(y_9-\frac{1}{2}\right)\,\hat{\mathbf{y}}+\frac{1}{2}a\,\hat{\mathbf{z}} & (24k) & \text{Cl VII}
\end{array}
$$

$\mathbf{B_{103}} = -\left(z_9 - \frac{1}{2}\right)\mathbf{a}_1 + \left(y_9 + \frac{1}{2}\right)\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3 = -a\left(z_9 - \frac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_9 + \frac{1}{2}\right)\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$ (24k) Cl VII

$\mathbf{B_{104}} = -\left(z_9 - \frac{1}{2}\right)\mathbf{a}_1 - \left(y_9 - \frac{1}{2}\right)\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3 = -a\left(z_9 - \frac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_9 - \frac{1}{2}\right)\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$ (24k) Cl VII

$\mathbf{B_{105}} = y_{10}\,\mathbf{a}_2 + z_{10}\,\mathbf{a}_3 = ay_{10}\,\hat{\mathbf{y}} + az_{10}\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{106}} = -y_{10}\,\mathbf{a}_2 + z_{10}\,\mathbf{a}_3 = -ay_{10}\,\hat{\mathbf{y}} + az_{10}\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{107}} = y_{10}\,\mathbf{a}_2 - z_{10}\,\mathbf{a}_3 = ay_{10}\,\hat{\mathbf{y}} - az_{10}\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{108}} = -y_{10}\,\mathbf{a}_2 - z_{10}\,\mathbf{a}_3 = -ay_{10}\,\hat{\mathbf{y}} - az_{10}\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{109}} = z_{10}\,\mathbf{a}_1 + y_{10}\,\mathbf{a}_3 = az_{10}\,\hat{\mathbf{x}} + ay_{10}\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{110}} = z_{10}\,\mathbf{a}_1 - y_{10}\,\mathbf{a}_3 = az_{10}\,\hat{\mathbf{x}} - ay_{10}\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{111}} = -z_{10}\,\mathbf{a}_1 + y_{10}\,\mathbf{a}_3 = -az_{10}\,\hat{\mathbf{x}} + ay_{10}\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{112}} = -z_{10}\,\mathbf{a}_1 - y_{10}\,\mathbf{a}_3 = -az_{10}\,\hat{\mathbf{x}} - ay_{10}\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{113}} = y_{10}\,\mathbf{a}_1 + z_{10}\,\mathbf{a}_2 = ay_{10}\,\hat{\mathbf{x}} + az_{10}\,\hat{\mathbf{y}}$ (24k) Hg II

$\mathbf{B_{114}} = -y_{10}\,\mathbf{a}_1 + z_{10}\,\mathbf{a}_2 = -ay_{10}\,\hat{\mathbf{x}} + az_{10}\,\hat{\mathbf{y}}$ (24k) Hg II

$\mathbf{B_{115}} = y_{10}\,\mathbf{a}_1 - z_{10}\,\mathbf{a}_2 = ay_{10}\,\hat{\mathbf{x}} - az_{10}\,\hat{\mathbf{y}}$ (24k) Hg II

$\mathbf{B_{116}} = -y_{10}\,\mathbf{a}_1 - z_{10}\,\mathbf{a}_2 = -ay_{10}\,\hat{\mathbf{x}} - az_{10}\,\hat{\mathbf{y}}$ (24k) Hg II

$\mathbf{B_{117}} = \left(y_{10} + \frac{1}{2}\right)\mathbf{a}_1 + \frac{1}{2}\mathbf{a}_2 - \left(z_{10} - \frac{1}{2}\right)\mathbf{a}_3 = a\left(y_{10} + \frac{1}{2}\right)\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} - a\left(z_{10} - \frac{1}{2}\right)\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{118}} = -\left(y_{10} - \frac{1}{2}\right)\mathbf{a}_1 + \frac{1}{2}\mathbf{a}_2 - \left(z_{10} - \frac{1}{2}\right)\mathbf{a}_3 = -a\left(y_{10} - \frac{1}{2}\right)\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} - a\left(z_{10} - \frac{1}{2}\right)\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{119}} = \left(y_{10} + \frac{1}{2}\right)\mathbf{a}_1 + \frac{1}{2}\mathbf{a}_2 + \left(z_{10} + \frac{1}{2}\right)\mathbf{a}_3 = a\left(y_{10} + \frac{1}{2}\right)\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + a\left(z_{10} + \frac{1}{2}\right)\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{120}} = -\left(y_{10} - \frac{1}{2}\right)\mathbf{a}_1 + \frac{1}{2}\mathbf{a}_2 + \left(z_{10} + \frac{1}{2}\right)\mathbf{a}_3 = -a\left(y_{10} - \frac{1}{2}\right)\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + a\left(z_{10} + \frac{1}{2}\right)\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{121}} = \frac{1}{2}\mathbf{a}_1 + \left(z_{10} + \frac{1}{2}\right)\mathbf{a}_2 - \left(y_{10} - \frac{1}{2}\right)\mathbf{a}_3 = \frac{1}{2}a\,\hat{\mathbf{x}} + a\left(z_{10} + \frac{1}{2}\right)\hat{\mathbf{y}} - a\left(y_{10} - \frac{1}{2}\right)\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{122}} = \frac{1}{2}\mathbf{a}_1 + \left(z_{10} + \frac{1}{2}\right)\mathbf{a}_2 + \left(y_{10} + \frac{1}{2}\right)\mathbf{a}_3 = \frac{1}{2}a\,\hat{\mathbf{x}} + a\left(z_{10} + \frac{1}{2}\right)\hat{\mathbf{y}} + a\left(y_{10} + \frac{1}{2}\right)\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{123}} = \frac{1}{2}\mathbf{a}_1 - \left(z_{10} - \frac{1}{2}\right)\mathbf{a}_2 - \left(y_{10} - \frac{1}{2}\right)\mathbf{a}_3 = \frac{1}{2}a\,\hat{\mathbf{x}} - a\left(z_{10} - \frac{1}{2}\right)\hat{\mathbf{y}} - a\left(y_{10} - \frac{1}{2}\right)\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{124}} = \frac{1}{2}\mathbf{a}_1 - \left(z_{10} - \frac{1}{2}\right)\mathbf{a}_2 + \left(y_{10} + \frac{1}{2}\right)\mathbf{a}_3 = \frac{1}{2}a\,\hat{\mathbf{x}} - a\left(z_{10} - \frac{1}{2}\right)\hat{\mathbf{y}} + a\left(y_{10} + \frac{1}{2}\right)\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{125}} = \left(z_{10} + \frac{1}{2}\right)\mathbf{a}_1 + \left(y_{10} + \frac{1}{2}\right)\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3 = a\left(z_{10} + \frac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_{10} + \frac{1}{2}\right)\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{126}} = \left(z_{10} + \frac{1}{2}\right)\mathbf{a}_1 - \left(y_{10} - \frac{1}{2}\right)\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3 = a\left(z_{10} + \frac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_{10} - \frac{1}{2}\right)\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{127}} = -\left(z_{10} - \frac{1}{2}\right)\mathbf{a}_1 + \left(y_{10} + \frac{1}{2}\right)\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3 = -a\left(z_{10} - \frac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_{10} + \frac{1}{2}\right)\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{128}} = -\left(z_{10} - \frac{1}{2}\right)\mathbf{a}_1 - \left(y_{10} - \frac{1}{2}\right)\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3 = -a\left(z_{10} - \frac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_{10} - \frac{1}{2}\right)\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$ (24k) Hg II

$\mathbf{B_{129}} = y_{11}\,\mathbf{a}_2 + z_{11}\,\mathbf{a}_3 = ay_{11}\,\hat{\mathbf{y}} + az_{11}\,\hat{\mathbf{z}}$ (24k) Hg III

$\mathbf{B_{130}} = -y_{11}\,\mathbf{a}_2 + z_{11}\,\mathbf{a}_3 = -ay_{11}\,\hat{\mathbf{y}} + az_{11}\,\hat{\mathbf{z}}$ (24k) Hg III

$\mathbf{B_{131}} = y_{11}\,\mathbf{a}_2 - z_{11}\,\mathbf{a}_3 = ay_{11}\,\hat{\mathbf{y}} - az_{11}\,\hat{\mathbf{z}}$ (24k) Hg III

$\mathbf{B_{132}} = -y_{11}\,\mathbf{a}_2 - z_{11}\,\mathbf{a}_3 = -ay_{11}\,\hat{\mathbf{y}} - az_{11}\,\hat{\mathbf{z}}$ (24k) Hg III

$\mathbf{B_{133}} = z_{11}\,\mathbf{a}_1 + y_{11}\,\mathbf{a}_3 = az_{11}\,\hat{\mathbf{x}} + ay_{11}\,\hat{\mathbf{z}}$ (24k) Hg III

$$\mathbf{B_{134}} = z_{11}\,\mathbf{a}_1 - y_{11}\,\mathbf{a}_3 = az_{11}\,\hat{\mathbf{x}} - ay_{11}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{135}} = -z_{11}\,\mathbf{a}_1 + y_{11}\,\mathbf{a}_3 = -az_{11}\,\hat{\mathbf{x}} + ay_{11}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{136}} = -z_{11}\,\mathbf{a}_1 - y_{11}\,\mathbf{a}_3 = -az_{11}\,\hat{\mathbf{x}} - ay_{11}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{137}} = y_{11}\,\mathbf{a}_1 + z_{11}\,\mathbf{a}_2 = ay_{11}\,\hat{\mathbf{x}} + az_{11}\,\hat{\mathbf{y}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{138}} = -y_{11}\,\mathbf{a}_1 + z_{11}\,\mathbf{a}_2 = -ay_{11}\,\hat{\mathbf{x}} + az_{11}\,\hat{\mathbf{y}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{139}} = y_{11}\,\mathbf{a}_1 - z_{11}\,\mathbf{a}_2 = ay_{11}\,\hat{\mathbf{x}} - az_{11}\,\hat{\mathbf{y}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{140}} = -y_{11}\,\mathbf{a}_1 - z_{11}\,\mathbf{a}_2 = -ay_{11}\,\hat{\mathbf{x}} - az_{11}\,\hat{\mathbf{y}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{141}} = \left(y_{11}+\tfrac{1}{2}\right)\mathbf{a}_1 + \tfrac{1}{2}\,\mathbf{a}_2 - \left(z_{11}-\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_{11}+\tfrac{1}{2}\right)\hat{\mathbf{x}} + \tfrac{1}{2}a\,\hat{\mathbf{y}} - a\left(z_{11}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{142}} = -\left(y_{11}-\tfrac{1}{2}\right)\mathbf{a}_1 + \tfrac{1}{2}\,\mathbf{a}_2 - \left(z_{11}-\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_{11}-\tfrac{1}{2}\right)\hat{\mathbf{x}} + \tfrac{1}{2}a\,\hat{\mathbf{y}} - a\left(z_{11}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{143}} = \left(y_{11}+\tfrac{1}{2}\right)\mathbf{a}_1 + \tfrac{1}{2}\,\mathbf{a}_2 + \left(z_{11}+\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_{11}+\tfrac{1}{2}\right)\hat{\mathbf{x}} + \tfrac{1}{2}a\,\hat{\mathbf{y}} + a\left(z_{11}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{144}} = -\left(y_{11}-\tfrac{1}{2}\right)\mathbf{a}_1 + \tfrac{1}{2}\,\mathbf{a}_2 + \left(z_{11}+\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_{11}-\tfrac{1}{2}\right)\hat{\mathbf{x}} + \tfrac{1}{2}a\,\hat{\mathbf{y}} + a\left(z_{11}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{145}} = \tfrac{1}{2}\,\mathbf{a}_1 + \left(z_{11}+\tfrac{1}{2}\right)\mathbf{a}_2 - \left(y_{11}-\tfrac{1}{2}\right)\mathbf{a}_3 = \tfrac{1}{2}a\,\hat{\mathbf{x}} + a\left(z_{11}+\tfrac{1}{2}\right)\hat{\mathbf{y}} - a\left(y_{11}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{146}} = \tfrac{1}{2}\,\mathbf{a}_1 + \left(z_{11}+\tfrac{1}{2}\right)\mathbf{a}_2 + \left(y_{11}+\tfrac{1}{2}\right)\mathbf{a}_3 = \tfrac{1}{2}a\,\hat{\mathbf{x}} + a\left(z_{11}+\tfrac{1}{2}\right)\hat{\mathbf{y}} + a\left(y_{11}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{147}} = \tfrac{1}{2}\,\mathbf{a}_1 - \left(z_{11}-\tfrac{1}{2}\right)\mathbf{a}_2 - \left(y_{11}-\tfrac{1}{2}\right)\mathbf{a}_3 = \tfrac{1}{2}a\,\hat{\mathbf{x}} - a\left(z_{11}-\tfrac{1}{2}\right)\hat{\mathbf{y}} - a\left(y_{11}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{148}} = \tfrac{1}{2}\,\mathbf{a}_1 - \left(z_{11}-\tfrac{1}{2}\right)\mathbf{a}_2 + \left(y_{11}+\tfrac{1}{2}\right)\mathbf{a}_3 = \tfrac{1}{2}a\,\hat{\mathbf{x}} - a\left(z_{11}-\tfrac{1}{2}\right)\hat{\mathbf{y}} + a\left(y_{11}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{149}} = \left(z_{11}+\tfrac{1}{2}\right)\mathbf{a}_1 + \left(y_{11}+\tfrac{1}{2}\right)\mathbf{a}_2 + \tfrac{1}{2}\,\mathbf{a}_3 = a\left(z_{11}+\tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_{11}+\tfrac{1}{2}\right)\hat{\mathbf{y}} + \tfrac{1}{2}a\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{150}} = \left(z_{11}+\tfrac{1}{2}\right)\mathbf{a}_1 - \left(y_{11}-\tfrac{1}{2}\right)\mathbf{a}_2 + \tfrac{1}{2}\,\mathbf{a}_3 = a\left(z_{11}+\tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_{11}-\tfrac{1}{2}\right)\hat{\mathbf{y}} + \tfrac{1}{2}a\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{151}} = -\left(z_{11}-\tfrac{1}{2}\right)\mathbf{a}_1 + \left(y_{11}+\tfrac{1}{2}\right)\mathbf{a}_2 + \tfrac{1}{2}\,\mathbf{a}_3 = -a\left(z_{11}-\tfrac{1}{2}\right)\hat{\mathbf{x}} + a\left(y_{11}+\tfrac{1}{2}\right)\hat{\mathbf{y}} + \tfrac{1}{2}a\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{152}} = -\left(z_{11}-\tfrac{1}{2}\right)\mathbf{a}_1 - \left(y_{11}-\tfrac{1}{2}\right)\mathbf{a}_2 + \tfrac{1}{2}\,\mathbf{a}_3 = -a\left(z_{11}-\tfrac{1}{2}\right)\hat{\mathbf{x}} - a\left(y_{11}-\tfrac{1}{2}\right)\hat{\mathbf{y}} + \tfrac{1}{2}a\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg III}$$

$$\mathbf{B_{153}} = y_{12}\,\mathbf{a}_2 + z_{12}\,\mathbf{a}_3 = ay_{12}\,\hat{\mathbf{y}} + az_{12}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{154}} = -y_{12}\,\mathbf{a}_2 + z_{12}\,\mathbf{a}_3 = -ay_{12}\,\hat{\mathbf{y}} + az_{12}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{155}} = y_{12}\,\mathbf{a}_2 - z_{12}\,\mathbf{a}_3 = ay_{12}\,\hat{\mathbf{y}} - az_{12}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{156}} = -y_{12}\,\mathbf{a}_2 - z_{12}\,\mathbf{a}_3 = -ay_{12}\,\hat{\mathbf{y}} - az_{12}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{157}} = z_{12}\,\mathbf{a}_1 + y_{12}\,\mathbf{a}_3 = az_{12}\,\hat{\mathbf{x}} + ay_{12}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{158}} = z_{12}\,\mathbf{a}_1 - y_{12}\,\mathbf{a}_3 = az_{12}\,\hat{\mathbf{x}} - ay_{12}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{159}} = -z_{12}\,\mathbf{a}_1 + y_{12}\,\mathbf{a}_3 = -az_{12}\,\hat{\mathbf{x}} + ay_{12}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{160}} = -z_{12}\,\mathbf{a}_1 - y_{12}\,\mathbf{a}_3 = -az_{12}\,\hat{\mathbf{x}} - ay_{12}\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{161}} = y_{12}\,\mathbf{a}_1 + z_{12}\,\mathbf{a}_2 = ay_{12}\,\hat{\mathbf{x}} + az_{12}\,\hat{\mathbf{y}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{162}} = -y_{12}\,\mathbf{a}_1 + z_{12}\,\mathbf{a}_2 = -ay_{12}\,\hat{\mathbf{x}} + az_{12}\,\hat{\mathbf{y}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{163}} = y_{12}\,\mathbf{a}_1 - z_{12}\,\mathbf{a}_2 = ay_{12}\,\hat{\mathbf{x}} - az_{12}\,\hat{\mathbf{y}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{164}} = -y_{12}\,\mathbf{a}_1 - z_{12}\,\mathbf{a}_2 = -ay_{12}\,\hat{\mathbf{x}} - az_{12}\,\hat{\mathbf{y}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{165}} = \left(y_{12}+\tfrac{1}{2}\right)\mathbf{a}_1+\tfrac{1}{2}\mathbf{a}_2-\left(z_{12}-\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_{12}+\tfrac{1}{2}\right)\hat{\mathbf{x}}+\tfrac{1}{2}a\,\hat{\mathbf{y}}-a\left(z_{12}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{166}} = -\left(y_{12}-\tfrac{1}{2}\right)\mathbf{a}_1+\tfrac{1}{2}\mathbf{a}_2-\left(z_{12}-\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_{12}-\tfrac{1}{2}\right)\hat{\mathbf{x}}+\tfrac{1}{2}a\,\hat{\mathbf{y}}-a\left(z_{12}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{167}} = \left(y_{12}+\tfrac{1}{2}\right)\mathbf{a}_1+\tfrac{1}{2}\mathbf{a}_2+\left(z_{12}+\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_{12}+\tfrac{1}{2}\right)\hat{\mathbf{x}}+\tfrac{1}{2}a\,\hat{\mathbf{y}}+a\left(z_{12}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{168}} = -\left(y_{12}-\tfrac{1}{2}\right)\mathbf{a}_1+\tfrac{1}{2}\mathbf{a}_2+\left(z_{12}+\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_{12}-\tfrac{1}{2}\right)\hat{\mathbf{x}}+\tfrac{1}{2}a\,\hat{\mathbf{y}}+a\left(z_{12}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{169}} = \tfrac{1}{2}\mathbf{a}_1+\left(z_{12}+\tfrac{1}{2}\right)\mathbf{a}_2-\left(y_{12}-\tfrac{1}{2}\right)\mathbf{a}_3 = \tfrac{1}{2}a\,\hat{\mathbf{x}}+a\left(z_{12}+\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(y_{12}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{170}} = \tfrac{1}{2}\mathbf{a}_1+\left(z_{12}+\tfrac{1}{2}\right)\mathbf{a}_2+\left(y_{12}+\tfrac{1}{2}\right)\mathbf{a}_3 = \tfrac{1}{2}a\,\hat{\mathbf{x}}+a\left(z_{12}+\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(y_{12}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{171}} = \tfrac{1}{2}\mathbf{a}_1-\left(z_{12}-\tfrac{1}{2}\right)\mathbf{a}_2-\left(y_{12}-\tfrac{1}{2}\right)\mathbf{a}_3 = \tfrac{1}{2}a\,\hat{\mathbf{x}}-a\left(z_{12}-\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(y_{12}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{172}} = \tfrac{1}{2}\mathbf{a}_1-\left(z_{12}-\tfrac{1}{2}\right)\mathbf{a}_2+\left(y_{12}+\tfrac{1}{2}\right)\mathbf{a}_3 = \tfrac{1}{2}a\,\hat{\mathbf{x}}-a\left(z_{12}-\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(y_{12}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{173}} = \left(z_{12}+\tfrac{1}{2}\right)\mathbf{a}_1+\left(y_{12}+\tfrac{1}{2}\right)\mathbf{a}_2+\tfrac{1}{2}\mathbf{a}_3 = a\left(z_{12}+\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(y_{12}+\tfrac{1}{2}\right)\hat{\mathbf{y}}+\tfrac{1}{2}a\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{174}} = \left(z_{12}+\tfrac{1}{2}\right)\mathbf{a}_1-\left(y_{12}-\tfrac{1}{2}\right)\mathbf{a}_2+\tfrac{1}{2}\mathbf{a}_3 = a\left(z_{12}+\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(y_{12}-\tfrac{1}{2}\right)\hat{\mathbf{y}}+\tfrac{1}{2}a\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{175}} = -\left(z_{12}-\tfrac{1}{2}\right)\mathbf{a}_1+\left(y_{12}+\tfrac{1}{2}\right)\mathbf{a}_2+\tfrac{1}{2}\mathbf{a}_3 = -a\left(z_{12}-\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(y_{12}+\tfrac{1}{2}\right)\hat{\mathbf{y}}+\tfrac{1}{2}a\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{176}} = -\left(z_{12}-\tfrac{1}{2}\right)\mathbf{a}_1-\left(y_{12}-\tfrac{1}{2}\right)\mathbf{a}_2+\tfrac{1}{2}\mathbf{a}_3 = -a\left(z_{12}-\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(y_{12}-\tfrac{1}{2}\right)\hat{\mathbf{y}}+\tfrac{1}{2}a\,\hat{\mathbf{z}} \quad (24k) \quad \text{Hg IV}$$

$$\mathbf{B_{177}} = x_{13}\mathbf{a}_1+y_{13}\mathbf{a}_2+z_{13}\mathbf{a}_3 = ax_{13}\hat{\mathbf{x}}+ay_{13}\hat{\mathbf{y}}+az_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{178}} = -x_{13}\mathbf{a}_1-y_{13}\mathbf{a}_2+z_{13}\mathbf{a}_3 = -ax_{13}\hat{\mathbf{x}}-ay_{13}\hat{\mathbf{y}}+az_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{179}} = -x_{13}\mathbf{a}_1+y_{13}\mathbf{a}_2-z_{13}\mathbf{a}_3 = -ax_{13}\hat{\mathbf{x}}+ay_{13}\hat{\mathbf{y}}-az_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{180}} = x_{13}\mathbf{a}_1-y_{13}\mathbf{a}_2-z_{13}\mathbf{a}_3 = ax_{13}\hat{\mathbf{x}}-ay_{13}\hat{\mathbf{y}}-az_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{181}} = z_{13}\mathbf{a}_1+x_{13}\mathbf{a}_2+y_{13}\mathbf{a}_3 = az_{13}\hat{\mathbf{x}}+ax_{13}\hat{\mathbf{y}}+ay_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{182}} = z_{13}\mathbf{a}_1-x_{13}\mathbf{a}_2-y_{13}\mathbf{a}_3 = az_{13}\hat{\mathbf{x}}-ax_{13}\hat{\mathbf{y}}-ay_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{183}} = -z_{13}\mathbf{a}_1-x_{13}\mathbf{a}_2+y_{13}\mathbf{a}_3 = -az_{13}\hat{\mathbf{x}}-ax_{13}\hat{\mathbf{y}}+ay_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{184}} = -z_{13}\mathbf{a}_1+x_{13}\mathbf{a}_2-y_{13}\mathbf{a}_3 = -az_{13}\hat{\mathbf{x}}+ax_{13}\hat{\mathbf{y}}-ay_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{185}} = y_{13}\mathbf{a}_1+z_{13}\mathbf{a}_2+x_{13}\mathbf{a}_3 = ay_{13}\hat{\mathbf{x}}+az_{13}\hat{\mathbf{y}}+ax_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{186}} = -y_{13}\mathbf{a}_1+z_{13}\mathbf{a}_2-x_{13}\mathbf{a}_3 = -ay_{13}\hat{\mathbf{x}}+az_{13}\hat{\mathbf{y}}-ax_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{187}} = y_{13}\mathbf{a}_1-z_{13}\mathbf{a}_2-x_{13}\mathbf{a}_3 = ay_{13}\hat{\mathbf{x}}-az_{13}\hat{\mathbf{y}}-ax_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{188}} = -y_{13}\mathbf{a}_1-z_{13}\mathbf{a}_2+x_{13}\mathbf{a}_3 = -ay_{13}\hat{\mathbf{x}}-az_{13}\hat{\mathbf{y}}+ax_{13}\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{189}} = \left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_1+\left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_2-\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{190}} = -\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_1-\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_2-\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{191}} = \left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_1-\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_2+\left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{192}} = -\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_1+\left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_2+\left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{193}} = \left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_1+\left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_2-\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{194}} = -\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_1+\left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_2+\left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{195}} = -\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_1-\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_2-\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{196}} = \left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_1-\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_2+\left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{197}} = \left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_1+\left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_2-\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{198}} = \left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_1-\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_2+\left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{199}} = -\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_1+\left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_2+\left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{200}} = -\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_1-\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_2-\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{201}} = -x_{13}\,\mathbf{a}_1-y_{13}\,\mathbf{a}_2-z_{13}\,\mathbf{a}_3 = -ax_{13}\,\hat{\mathbf{x}}-ay_{13}\,\hat{\mathbf{y}}-az_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{202}} = x_{13}\,\mathbf{a}_1+y_{13}\,\mathbf{a}_2-z_{13}\,\mathbf{a}_3 = ax_{13}\,\hat{\mathbf{x}}+ay_{13}\,\hat{\mathbf{y}}-az_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{203}} = x_{13}\,\mathbf{a}_1-y_{13}\,\mathbf{a}_2+z_{13}\,\mathbf{a}_3 = ax_{13}\,\hat{\mathbf{x}}-ay_{13}\,\hat{\mathbf{y}}+az_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{204}} = -x_{13}\,\mathbf{a}_1+y_{13}\,\mathbf{a}_2+z_{13}\,\mathbf{a}_3 = -ax_{13}\,\hat{\mathbf{x}}+ay_{13}\,\hat{\mathbf{y}}+az_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{205}} = -z_{13}\,\mathbf{a}_1-x_{13}\,\mathbf{a}_2-y_{13}\,\mathbf{a}_3 = -az_{13}\,\hat{\mathbf{x}}-ax_{13}\,\hat{\mathbf{y}}-ay_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{206}} = -z_{13}\,\mathbf{a}_1+x_{13}\,\mathbf{a}_2+y_{13}\,\mathbf{a}_3 = -az_{13}\,\hat{\mathbf{x}}+ax_{13}\,\hat{\mathbf{y}}+ay_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{207}} = z_{13}\,\mathbf{a}_1+x_{13}\,\mathbf{a}_2-y_{13}\,\mathbf{a}_3 = az_{13}\,\hat{\mathbf{x}}+ax_{13}\,\hat{\mathbf{y}}-ay_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{208}} = z_{13}\,\mathbf{a}_1-x_{13}\,\mathbf{a}_2+y_{13}\,\mathbf{a}_3 = az_{13}\,\hat{\mathbf{x}}-ax_{13}\,\hat{\mathbf{y}}+ay_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{209}} = -y_{13}\,\mathbf{a}_1-z_{13}\,\mathbf{a}_2-x_{13}\,\mathbf{a}_3 = -ay_{13}\,\hat{\mathbf{x}}-az_{13}\,\hat{\mathbf{y}}-ax_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{210}} = y_{13}\,\mathbf{a}_1-z_{13}\,\mathbf{a}_2+x_{13}\,\mathbf{a}_3 = ay_{13}\,\hat{\mathbf{x}}-az_{13}\,\hat{\mathbf{y}}+ax_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{211}} = -y_{13}\,\mathbf{a}_1+z_{13}\,\mathbf{a}_2+x_{13}\,\mathbf{a}_3 = -ay_{13}\,\hat{\mathbf{x}}+az_{13}\,\hat{\mathbf{y}}+ax_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{212}} = y_{13}\,\mathbf{a}_1+z_{13}\,\mathbf{a}_2-x_{13}\,\mathbf{a}_3 = ay_{13}\,\hat{\mathbf{x}}+az_{13}\,\hat{\mathbf{y}}-ax_{13}\,\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{213}} = -\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_1-\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_2+\left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{214}} = \left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_1+\left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_2+\left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{215}} = -\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_1+\left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_2-\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{216}} = \left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_1-\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_2-\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{217}} = -\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_1-\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_2+\left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{218}} = \left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_1-\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_2-\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{219}} = \left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_1+\left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_2+\left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{220}} = -\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_1+\left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_2-\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{221}} = -\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_1-\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_2+\left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{222}} = -\left(z_{13}-\tfrac{1}{2}\right)\mathbf{a}_1+\left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_2-\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = -a\left(z_{13}-\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{223}} = \left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_1-\left(y_{13}-\tfrac{1}{2}\right)\mathbf{a}_2-\left(x_{13}-\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}-a\left(y_{13}-\tfrac{1}{2}\right)\hat{\mathbf{y}}-a\left(x_{13}-\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

$$\mathbf{B_{224}} = \left(z_{13}+\tfrac{1}{2}\right)\mathbf{a}_1+\left(y_{13}+\tfrac{1}{2}\right)\mathbf{a}_2+\left(x_{13}+\tfrac{1}{2}\right)\mathbf{a}_3 = a\left(z_{13}+\tfrac{1}{2}\right)\hat{\mathbf{x}}+a\left(y_{13}+\tfrac{1}{2}\right)\hat{\mathbf{y}}+a\left(x_{13}+\tfrac{1}{2}\right)\hat{\mathbf{z}} \quad (48l) \quad \text{S II}$$

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