Na_4Ge_{13} Structure: A19B10_hP58_175_e2j2kl_djl-001

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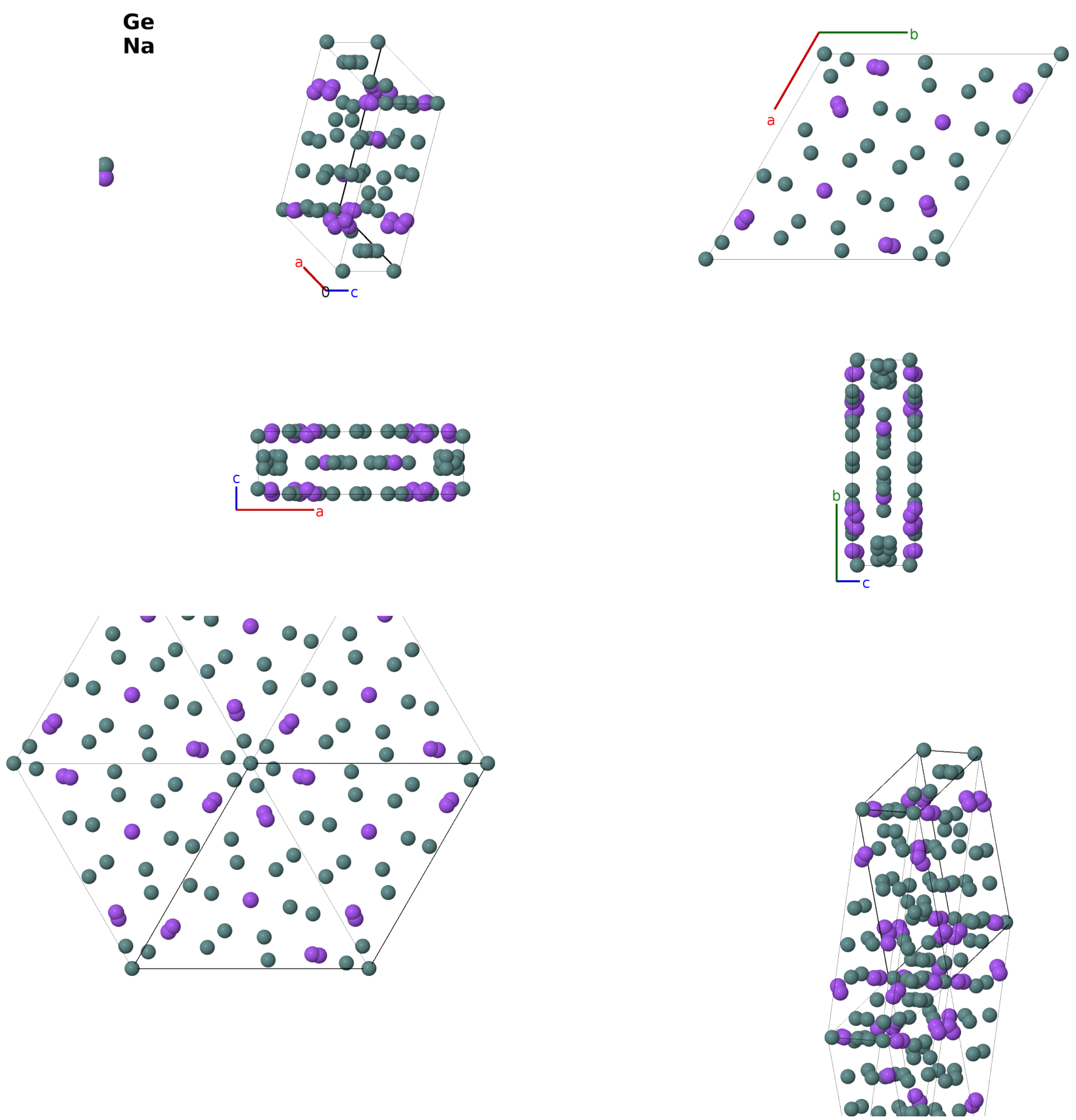
https://aflow.org/prototype-encyclopedia/XPLN

https://aflow.org/prototype-encyclopedia/A19B10_hP58_175_e2j2kl_djl-001



Prototype $Ge_{13}Na_4$

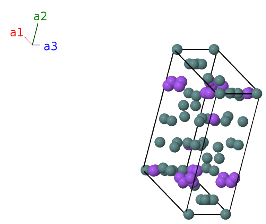
AFLOW prototype label A19B10_hP58_175_e2j2kl_djl-001

ICSD	256042
CCDC	1585853
Pearson symbol	hP58
Space group number	175
Space group symbol	$P6/m$
AFLOW prototype command	`aflow --proto=A19B10_hP58_175_e2j2kl_djl-001` `--params=`$a, c/a, z_2, x_3, y_3, x_4, y_4, x_5, y_5, x_6, y_6, x_7, y_7, x_8, y_8, z_8, x_9, y_9, z_9$

- There are a large number of vacancies in this structure leading to the composition Na_4Ge_{13}:
  - The Ge-I (2e) site is only occupied 25% of the time.
  - The Na-II (6j) site has 50% occupation, so that only one of each sodium doublet is occupied.
  - The Ge-VI (12l) site has 12.5% occupation.
  - The Ni-III (12) site has 25% occupation.

Hexagonal primitive vectors

$$\mathbf{a_1} = \frac{1}{2}a\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\,\hat{\mathbf{y}}$$
$$\mathbf{a_2} = \frac{1}{2}a\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\,\hat{\mathbf{y}}$$
$$\mathbf{a_3} = c\,\hat{\mathbf{z}}$$



Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_1}$	=	$\frac{1}{3}\,\mathbf{a}_1 + \frac{2}{3}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(2d)	Na I
$\mathbf{B_2}$	=	$\frac{2}{3}\,\mathbf{a}_1 + \frac{1}{3}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(2d)	Na I
$\mathbf{B_3}$	=	$z_2\,\mathbf{a}_3$	=	$cz_2\,\hat{\mathbf{z}}$	(2e)	Ge I
$\mathbf{B_4}$	=	$-z_2\,\mathbf{a}_3$	=	$-cz_2\,\hat{\mathbf{z}}$	(2e)	Ge I
$\mathbf{B_5}$	=	$x_3\,\mathbf{a}_1 + y_3\,\mathbf{a}_2$	=	$\frac{1}{2}a\,(x_3+y_3)\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\,(x_3-y_3)\,\hat{\mathbf{y}}$	(6j)	Ge II
$\mathbf{B_6}$	=	$-y_3\,\mathbf{a}_1 + (x_3-y_3)\,\mathbf{a}_2$	=	$\frac{1}{2}a\,(x_3-2y_3)\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_3\,\hat{\mathbf{y}}$	(6j)	Ge II
$\mathbf{B_7}$	=	$-(x_3-y_3)\,\mathbf{a}_1 - x_3\,\mathbf{a}_2$	=	$-\frac{1}{2}a\,(2x_3-y_3)\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ay_3\,\hat{\mathbf{y}}$	(6j)	Ge II
$\mathbf{B_8}$	=	$-x_3\,\mathbf{a}_1 - y_3\,\mathbf{a}_2$	=	$-\frac{1}{2}a\,(x_3+y_3)\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\,(x_3-y_3)\,\hat{\mathbf{y}}$	(6j)	Ge II
$\mathbf{B_9}$	=	$y_3\,\mathbf{a}_1 - (x_3-y_3)\,\mathbf{a}_2$	=	$\frac{1}{2}a\,(-x_3+2y_3)\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_3\,\hat{\mathbf{y}}$	(6j)	Ge II
$\mathbf{B_{10}}$	=	$(x_3-y_3)\,\mathbf{a}_1 + x_3\,\mathbf{a}_2$	=	$\frac{1}{2}a\,(2x_3-y_3)\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ay_3\,\hat{\mathbf{y}}$	(6j)	Ge II
$\mathbf{B_{11}}$	=	$x_4\,\mathbf{a}_1 + y_4\,\mathbf{a}_2$	=	$\frac{1}{2}a\,(x_4+y_4)\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\,(x_4-y_4)\,\hat{\mathbf{y}}$	(6j)	Ge III
$\mathbf{B_{12}}$	=	$-y_4\,\mathbf{a}_1 + (x_4-y_4)\,\mathbf{a}_2$	=	$\frac{1}{2}a\,(x_4-2y_4)\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_4\,\hat{\mathbf{y}}$	(6j)	Ge III
$\mathbf{B_{13}}$	=	$-(x_4-y_4)\,\mathbf{a}_1 - x_4\,\mathbf{a}_2$	=	$-\frac{1}{2}a\,(2x_4-y_4)\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ay_4\,\hat{\mathbf{y}}$	(6j)	Ge III
$\mathbf{B_{14}}$	=	$-x_4\,\mathbf{a}_1 - y_4\,\mathbf{a}_2$	=	$-\frac{1}{2}a\,(x_4+y_4)\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\,(x_4-y_4)\,\hat{\mathbf{y}}$	(6j)	Ge III
$\mathbf{B_{15}}$	=	$y_4\,\mathbf{a}_1 - (x_4-y_4)\,\mathbf{a}_2$	=	$\frac{1}{2}a\,(-x_4+2y_4)\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_4\,\hat{\mathbf{y}}$	(6j)	Ge III
$\mathbf{B_{16}}$	=	$(x_4-y_4)\,\mathbf{a}_1 + x_4\,\mathbf{a}_2$	=	$\frac{1}{2}a\,(2x_4-y_4)\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ay_4\,\hat{\mathbf{y}}$	(6j)	Ge III

$\mathbf{B}_{17}$	=	$x_5\,\mathbf{a}_1 + y_5\,\mathbf{a}_2$	=	$\frac{1}{2}a\left(x_5+y_5\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\left(x_5-y_5\right)\hat{\mathbf{y}}$	(6j)	Na II
$\mathbf{B}_{18}$	=	$-y_5\,\mathbf{a}_1 + \left(x_5-y_5\right)\mathbf{a}_2$	=	$\frac{1}{2}a\left(x_5-2y_5\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_5\,\hat{\mathbf{y}}$	(6j)	Na II
$\mathbf{B}_{19}$	=	$-\left(x_5-y_5\right)\mathbf{a}_1 - x_5\,\mathbf{a}_2$	=	$-\frac{1}{2}a\left(2x_5-y_5\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ay_5\,\hat{\mathbf{y}}$	(6j)	Na II
$\mathbf{B}_{20}$	=	$-x_5\,\mathbf{a}_1 - y_5\,\mathbf{a}_2$	=	$-\frac{1}{2}a\left(x_5+y_5\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\left(x_5-y_5\right)\hat{\mathbf{y}}$	(6j)	Na II
$\mathbf{B}_{21}$	=	$y_5\,\mathbf{a}_1 - \left(x_5-y_5\right)\mathbf{a}_2$	=	$\frac{1}{2}a\left(-x_5+2y_5\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_5\,\hat{\mathbf{y}}$	(6j)	Na II
$\mathbf{B}_{22}$	=	$\left(x_5-y_5\right)\mathbf{a}_1 + x_5\,\mathbf{a}_2$	=	$\frac{1}{2}a\left(2x_5-y_5\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ay_5\,\hat{\mathbf{y}}$	(6j)	Na II
$\mathbf{B}_{23}$	=	$x_6\,\mathbf{a}_1 + y_6\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_6+y_6\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\left(x_6-y_6\right)\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge IV
$\mathbf{B}_{24}$	=	$-y_6\,\mathbf{a}_1 + \left(x_6-y_6\right)\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_6-2y_6\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_6\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge IV
$\mathbf{B}_{25}$	=	$-\left(x_6-y_6\right)\mathbf{a}_1 - x_6\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(2x_6-y_6\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ay_6\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge IV
$\mathbf{B}_{26}$	=	$-x_6\,\mathbf{a}_1 - y_6\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(x_6+y_6\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\left(x_6-y_6\right)\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge IV
$\mathbf{B}_{27}$	=	$y_6\,\mathbf{a}_1 - \left(x_6-y_6\right)\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(-x_6+2y_6\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_6\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge IV
$\mathbf{B}_{28}$	=	$\left(x_6-y_6\right)\mathbf{a}_1 + x_6\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(2x_6-y_6\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ay_6\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge IV
$\mathbf{B}_{29}$	=	$x_7\,\mathbf{a}_1 + y_7\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_7+y_7\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\left(x_7-y_7\right)\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge V
$\mathbf{B}_{30}$	=	$-y_7\,\mathbf{a}_1 + \left(x_7-y_7\right)\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_7-2y_7\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_7\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge V
$\mathbf{B}_{31}$	=	$-\left(x_7-y_7\right)\mathbf{a}_1 - x_7\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(2x_7-y_7\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ay_7\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge V
$\mathbf{B}_{32}$	=	$-x_7\,\mathbf{a}_1 - y_7\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(x_7+y_7\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\left(x_7-y_7\right)\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge V
$\mathbf{B}_{33}$	=	$y_7\,\mathbf{a}_1 - \left(x_7-y_7\right)\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(-x_7+2y_7\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_7\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge V
$\mathbf{B}_{34}$	=	$\left(x_7-y_7\right)\mathbf{a}_1 + x_7\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(2x_7-y_7\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ay_7\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(6k)	Ge V
$\mathbf{B}_{35}$	=	$x_8\,\mathbf{a}_1 + y_8\,\mathbf{a}_2 + z_8\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_8+y_8\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\left(x_8-y_8\right)\hat{\mathbf{y}} + cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{36}$	=	$-y_8\,\mathbf{a}_1 + \left(x_8-y_8\right)\mathbf{a}_2 + z_8\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_8-2y_8\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_8\,\hat{\mathbf{y}} + cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{37}$	=	$-\left(x_8-y_8\right)\mathbf{a}_1 - x_8\,\mathbf{a}_2 + z_8\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(2x_8-y_8\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ay_8\,\hat{\mathbf{y}} + cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{38}$	=	$-x_8\,\mathbf{a}_1 - y_8\,\mathbf{a}_2 + z_8\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(x_8+y_8\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\left(x_8-y_8\right)\hat{\mathbf{y}} + cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{39}$	=	$y_8\,\mathbf{a}_1 - \left(x_8-y_8\right)\mathbf{a}_2 + z_8\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(-x_8+2y_8\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_8\,\hat{\mathbf{y}} + cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{40}$	=	$\left(x_8-y_8\right)\mathbf{a}_1 + x_8\,\mathbf{a}_2 + z_8\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(2x_8-y_8\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ay_8\,\hat{\mathbf{y}} + cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{41}$	=	$-x_8\,\mathbf{a}_1 - y_8\,\mathbf{a}_2 - z_8\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(x_8+y_8\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\left(x_8-y_8\right)\hat{\mathbf{y}} - cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{42}$	=	$y_8\,\mathbf{a}_1 - \left(x_8-y_8\right)\mathbf{a}_2 - z_8\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(-x_8+2y_8\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_8\,\hat{\mathbf{y}} - cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{43}$	=	$\left(x_8-y_8\right)\mathbf{a}_1 + x_8\,\mathbf{a}_2 - z_8\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(2x_8-y_8\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ay_8\,\hat{\mathbf{y}} - cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{44}$	=	$x_8\,\mathbf{a}_1 + y_8\,\mathbf{a}_2 - z_8\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_8+y_8\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\left(x_8-y_8\right)\hat{\mathbf{y}} - cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{45}$	=	$-y_8\,\mathbf{a}_1 + \left(x_8-y_8\right)\mathbf{a}_2 - z_8\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_8-2y_8\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_8\,\hat{\mathbf{y}} - cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{46}$	=	$-\left(x_8-y_8\right)\mathbf{a}_1 - x_8\,\mathbf{a}_2 - z_8\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(2x_8-y_8\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ay_8\,\hat{\mathbf{y}} - cz_8\,\hat{\mathbf{z}}$	(12l)	Ge VI
$\mathbf{B}_{47}$	=	$x_9\,\mathbf{a}_1 + y_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_9+y_9\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\left(x_9-y_9\right)\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}}$	(12l)	Na III
$\mathbf{B}_{48}$	=	$-y_9\,\mathbf{a}_1 + \left(x_9-y_9\right)\mathbf{a}_2 + z_9\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_9-2y_9\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}}$	(12l)	Na III
$\mathbf{B}_{49}$	=	$-\left(x_9-y_9\right)\mathbf{a}_1 - x_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(2x_9-y_9\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ay_9\,\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}}$	(12l)	Na III
$\mathbf{B}_{50}$	=	$-x_9\,\mathbf{a}_1 - y_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(x_9+y_9\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\left(x_9-y_9\right)\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}}$	(12l)	Na III
$\mathbf{B}_{51}$	=	$y_9\,\mathbf{a}_1 - \left(x_9-y_9\right)\mathbf{a}_2 + z_9\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(-x_9+2y_9\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}}$	(12l)	Na III
$\mathbf{B}_{52}$	=	$\left(x_9-y_9\right)\mathbf{a}_1 + x_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(2x_9-y_9\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ay_9\,\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}}$	(12l)	Na III
$\mathbf{B}_{53}$	=	$-x_9\,\mathbf{a}_1 - y_9\,\mathbf{a}_2 - z_9\,\mathbf{a}_3$	=	$-\frac{1}{2}a\left(x_9+y_9\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\left(x_9-y_9\right)\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}}$	(12l)	Na III
$\mathbf{B}_{54}$	=	$y_9\,\mathbf{a}_1 - \left(x_9-y_9\right)\mathbf{a}_2 - z_9\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(-x_9+2y_9\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}}$	(12l)	Na III
$\mathbf{B}_{55}$	=	$\left(x_9-y_9\right)\mathbf{a}_1 + x_9\,\mathbf{a}_2 - z_9\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(2x_9-y_9\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ay_9\,\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}}$	(12l)	Na III
$\mathbf{B}_{56}$	=	$x_9\,\mathbf{a}_1 + y_9\,\mathbf{a}_2 - z_9\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_9+y_9\right)\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\left(x_9-y_9\right)\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}}$	(12l)	Na III
$\mathbf{B}_{57}$	=	$-y_9\,\mathbf{a}_1 + \left(x_9-y_9\right)\mathbf{a}_2 - z_9\,\mathbf{a}_3$	=	$\frac{1}{2}a\left(x_9-2y_9\right)\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}}$	(12l)	Na III

$$\mathbf{B_{58}} = -\left(x_9 - y_9\right)\,\mathbf{a}_1 - x_9\,\mathbf{a_2} - z_9\,\mathbf{a}_3 = -\frac{1}{2}a\left(2x_9 - y_9\right)\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ay_9\,\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}} \qquad (12l) \qquad \text{Na III}$$

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