

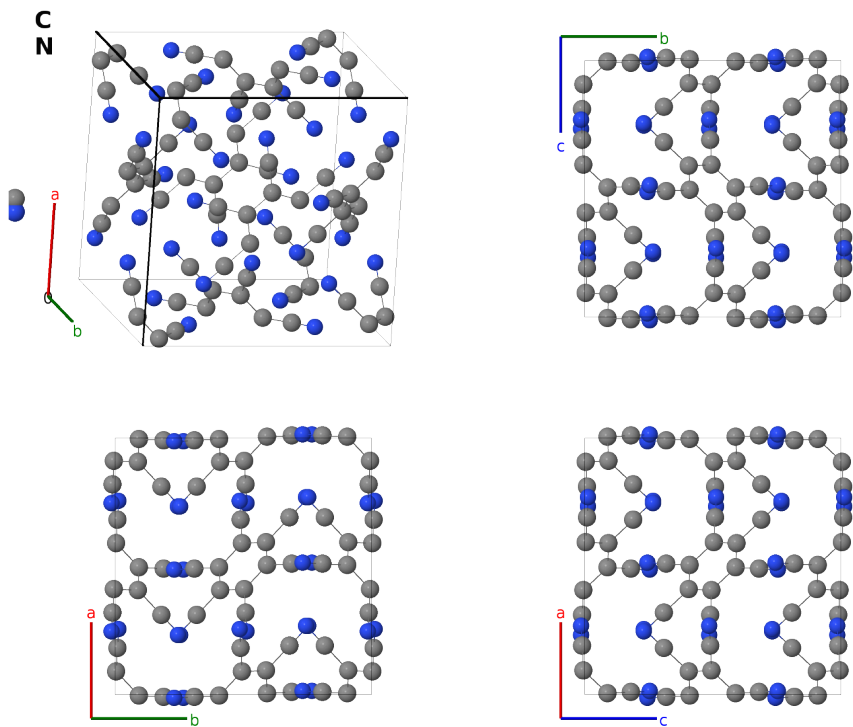
Hexacyanobenzene (C₂N) Structure: A2B_cP72_205_2d_d-001

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<https://aflow.org/prototype-encyclopedia/8E2P>

https://aflow.org/prototype-encyclopedia/A2B_cP72_205_2d_d-001



Prototype	C ₂ N
AFLOW prototype label	A2B_cP72_205_2d_d-001
Mineral name	hexacyanobenzene
ICSD	30814
CCDC	1118130
Pearson symbol	cP72
Space group number	205
Space group symbol	$Pa\bar{3}$
AFLOW prototype command	<code>aflow --proto=A2B_cP72_205_2d_d-001</code> <code>--params=a, x₁, y₁, z₁, x₂, y₂, z₂, x₃, y₃, z₃</code>

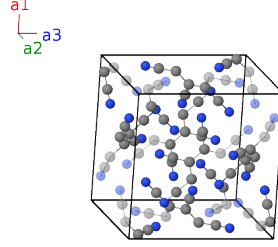
- We use the “High angle” measurements of (Dr”uck, 1984).

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
$\mathbf{B}_1$	$= x_1 \mathbf{a}_1 + y_1 \mathbf{a}_2 + z_1 \mathbf{a}_3$	$=$	$ax_1 \hat{\mathbf{x}} + ay_1 \hat{\mathbf{y}} + az_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_2$	$= -\left(x_1 - \frac{1}{2}\right) \mathbf{a}_1 - y_1 \mathbf{a}_2 + \left(z_1 + \frac{1}{2}\right) \mathbf{a}_3$	$=$	$-a\left(x_1 - \frac{1}{2}\right) \hat{\mathbf{x}} - ay_1 \hat{\mathbf{y}} + a\left(z_1 + \frac{1}{2}\right) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_3$	$= -x_1 \mathbf{a}_1 + \left(y_1 + \frac{1}{2}\right) \mathbf{a}_2 - \left(z_1 - \frac{1}{2}\right) \mathbf{a}_3$	$=$	$-ax_1 \hat{\mathbf{x}} + a\left(y_1 + \frac{1}{2}\right) \hat{\mathbf{y}} - a\left(z_1 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_4$	$= \left(x_1 + \frac{1}{2}\right) \mathbf{a}_1 - \left(y_1 - \frac{1}{2}\right) \mathbf{a}_2 - z_1 \mathbf{a}_3$	$=$	$a\left(x_1 + \frac{1}{2}\right) \hat{\mathbf{x}} - a\left(y_1 - \frac{1}{2}\right) \hat{\mathbf{y}} - az_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_5$	$= z_1 \mathbf{a}_1 + x_1 \mathbf{a}_2 + y_1 \mathbf{a}_3$	$=$	$az_1 \hat{\mathbf{x}} + ax_1 \hat{\mathbf{y}} + ay_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_6$	$= \left(z_1 + \frac{1}{2}\right) \mathbf{a}_1 - \left(x_1 - \frac{1}{2}\right) \mathbf{a}_2 - y_1 \mathbf{a}_3$	$=$	$a\left(z_1 + \frac{1}{2}\right) \hat{\mathbf{x}} - a\left(x_1 - \frac{1}{2}\right) \hat{\mathbf{y}} - ay_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_7$	$= -\left(z_1 - \frac{1}{2}\right) \mathbf{a}_1 - x_1 \mathbf{a}_2 + \left(y_1 + \frac{1}{2}\right) \mathbf{a}_3$	$=$	$-a\left(z_1 - \frac{1}{2}\right) \hat{\mathbf{x}} - ax_1 \hat{\mathbf{y}} + a\left(y_1 + \frac{1}{2}\right) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_8$	$= -z_1 \mathbf{a}_1 + \left(x_1 + \frac{1}{2}\right) \mathbf{a}_2 - \left(y_1 - \frac{1}{2}\right) \mathbf{a}_3$	$=$	$-az_1 \hat{\mathbf{x}} + a\left(x_1 + \frac{1}{2}\right) \hat{\mathbf{y}} - a\left(y_1 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_9$	$= y_1 \mathbf{a}_1 + z_1 \mathbf{a}_2 + x_1 \mathbf{a}_3$	$=$	$ay_1 \hat{\mathbf{x}} + az_1 \hat{\mathbf{y}} + ax_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{10}$	$= -y_1 \mathbf{a}_1 + \left(z_1 + \frac{1}{2}\right) \mathbf{a}_2 - \left(x_1 - \frac{1}{2}\right) \mathbf{a}_3$	$=$	$-ay_1 \hat{\mathbf{x}} + a\left(z_1 + \frac{1}{2}\right) \hat{\mathbf{y}} - a\left(x_1 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{11}$	$= \left(y_1 + \frac{1}{2}\right) \mathbf{a}_1 - \left(z_1 - \frac{1}{2}\right) \mathbf{a}_2 - x_1 \mathbf{a}_3$	$=$	$a\left(y_1 + \frac{1}{2}\right) \hat{\mathbf{x}} - a\left(z_1 - \frac{1}{2}\right) \hat{\mathbf{y}} - ax_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{12}$	$= -\left(y_1 - \frac{1}{2}\right) \mathbf{a}_1 - z_1 \mathbf{a}_2 + \left(x_1 + \frac{1}{2}\right) \mathbf{a}_3$	$=$	$-a\left(y_1 - \frac{1}{2}\right) \hat{\mathbf{x}} - az_1 \hat{\mathbf{y}} + a\left(x_1 + \frac{1}{2}\right) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{13}$	$= -x_1 \mathbf{a}_1 - y_1 \mathbf{a}_2 - z_1 \mathbf{a}_3$	$=$	$-ax_1 \hat{\mathbf{x}} - ay_1 \hat{\mathbf{y}} - az_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{14}$	$= \left(x_1 + \frac{1}{2}\right) \mathbf{a}_1 + y_1 \mathbf{a}_2 - \left(z_1 - \frac{1}{2}\right) \mathbf{a}_3$	$=$	$a\left(x_1 + \frac{1}{2}\right) \hat{\mathbf{x}} + ay_1 \hat{\mathbf{y}} - a\left(z_1 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{15}$	$= x_1 \mathbf{a}_1 - \left(y_1 - \frac{1}{2}\right) \mathbf{a}_2 + \left(z_1 + \frac{1}{2}\right) \mathbf{a}_3$	$=$	$ax_1 \hat{\mathbf{x}} - a\left(y_1 - \frac{1}{2}\right) \hat{\mathbf{y}} + a\left(z_1 + \frac{1}{2}\right) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{16}$	$= -\left(x_1 - \frac{1}{2}\right) \mathbf{a}_1 + \left(y_1 + \frac{1}{2}\right) \mathbf{a}_2 + z_1 \mathbf{a}_3$	$=$	$-a\left(x_1 - \frac{1}{2}\right) \hat{\mathbf{x}} + a\left(y_1 + \frac{1}{2}\right) \hat{\mathbf{y}} + az_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{17}$	$= -z_1 \mathbf{a}_1 - x_1 \mathbf{a}_2 - y_1 \mathbf{a}_3$	$=$	$-az_1 \hat{\mathbf{x}} - ax_1 \hat{\mathbf{y}} - ay_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{18}$	$= -\left(z_1 - \frac{1}{2}\right) \mathbf{a}_1 + \left(x_1 + \frac{1}{2}\right) \mathbf{a}_2 + y_1 \mathbf{a}_3$	$=$	$-a\left(z_1 - \frac{1}{2}\right) \hat{\mathbf{x}} + a\left(x_1 + \frac{1}{2}\right) \hat{\mathbf{y}} + ay_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{19}$	$= \left(z_1 + \frac{1}{2}\right) \mathbf{a}_1 + x_1 \mathbf{a}_2 - \left(y_1 - \frac{1}{2}\right) \mathbf{a}_3$	$=$	$a\left(z_1 + \frac{1}{2}\right) \hat{\mathbf{x}} + ax_1 \hat{\mathbf{y}} - a\left(y_1 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{20}$	$= z_1 \mathbf{a}_1 - \left(x_1 - \frac{1}{2}\right) \mathbf{a}_2 + \left(y_1 + \frac{1}{2}\right) \mathbf{a}_3$	$=$	$az_1 \hat{\mathbf{x}} - a\left(x_1 - \frac{1}{2}\right) \hat{\mathbf{y}} + a\left(y_1 + \frac{1}{2}\right) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{21}$	$= -y_1 \mathbf{a}_1 - z_1 \mathbf{a}_2 - x_1 \mathbf{a}_3$	$=$	$-ay_1 \hat{\mathbf{x}} - az_1 \hat{\mathbf{y}} - ax_1 \hat{\mathbf{z}}$	(24d)	C I

$\mathbf{B}_{22} =$	$y_1 \mathbf{a}_1 - (z_1 - \frac{1}{2}) \mathbf{a}_2 + (x_1 + \frac{1}{2}) \mathbf{a}_3 =$	$ay_1 \hat{\mathbf{x}} - a(z_1 - \frac{1}{2}) \hat{\mathbf{y}} + a(x_1 + \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{23} =$	$-(y_1 - \frac{1}{2}) \mathbf{a}_1 + (z_1 + \frac{1}{2}) \mathbf{a}_2 + x_1 \mathbf{a}_3 =$	$-a(y_1 - \frac{1}{2}) \hat{\mathbf{x}} + a(z_1 + \frac{1}{2}) \hat{\mathbf{y}} + ax_1 \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{24} =$	$(y_1 + \frac{1}{2}) \mathbf{a}_1 + z_1 \mathbf{a}_2 - (x_1 - \frac{1}{2}) \mathbf{a}_3 =$	$a(y_1 + \frac{1}{2}) \hat{\mathbf{x}} + az_1 \hat{\mathbf{y}} - a(x_1 - \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C I
$\mathbf{B}_{25} =$	$x_2 \mathbf{a}_1 + y_2 \mathbf{a}_2 + z_2 \mathbf{a}_3 =$	$ax_2 \hat{\mathbf{x}} + ay_2 \hat{\mathbf{y}} + az_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{26} =$	$-(x_2 - \frac{1}{2}) \mathbf{a}_1 - y_2 \mathbf{a}_2 + (z_2 + \frac{1}{2}) \mathbf{a}_3 =$	$-a(x_2 - \frac{1}{2}) \hat{\mathbf{x}} - ay_2 \hat{\mathbf{y}} + a(z_2 + \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{27} =$	$-x_2 \mathbf{a}_1 + (y_2 + \frac{1}{2}) \mathbf{a}_2 - (z_2 - \frac{1}{2}) \mathbf{a}_3 =$	$-ax_2 \hat{\mathbf{x}} + a(y_2 + \frac{1}{2}) \hat{\mathbf{y}} - a(z_2 - \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{28} =$	$(x_2 + \frac{1}{2}) \mathbf{a}_1 - (y_2 - \frac{1}{2}) \mathbf{a}_2 - z_2 \mathbf{a}_3 =$	$a(x_2 + \frac{1}{2}) \hat{\mathbf{x}} - a(y_2 - \frac{1}{2}) \hat{\mathbf{y}} - az_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{29} =$	$z_2 \mathbf{a}_1 + x_2 \mathbf{a}_2 + y_2 \mathbf{a}_3 =$	$az_2 \hat{\mathbf{x}} + ax_2 \hat{\mathbf{y}} + ay_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{30} =$	$(z_2 + \frac{1}{2}) \mathbf{a}_1 - (x_2 - \frac{1}{2}) \mathbf{a}_2 - y_2 \mathbf{a}_3 =$	$a(z_2 + \frac{1}{2}) \hat{\mathbf{x}} - a(x_2 - \frac{1}{2}) \hat{\mathbf{y}} - ay_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{31} =$	$-(z_2 - \frac{1}{2}) \mathbf{a}_1 - x_2 \mathbf{a}_2 + (y_2 + \frac{1}{2}) \mathbf{a}_3 =$	$-a(z_2 - \frac{1}{2}) \hat{\mathbf{x}} - ax_2 \hat{\mathbf{y}} + a(y_2 + \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{32} =$	$-z_2 \mathbf{a}_1 + (x_2 + \frac{1}{2}) \mathbf{a}_2 - (y_2 - \frac{1}{2}) \mathbf{a}_3 =$	$-az_2 \hat{\mathbf{x}} + a(x_2 + \frac{1}{2}) \hat{\mathbf{y}} - a(y_2 - \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{33} =$	$y_2 \mathbf{a}_1 + z_2 \mathbf{a}_2 + x_2 \mathbf{a}_3 =$	$ay_2 \hat{\mathbf{x}} + az_2 \hat{\mathbf{y}} + ax_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{34} =$	$-y_2 \mathbf{a}_1 + (z_2 + \frac{1}{2}) \mathbf{a}_2 - (x_2 - \frac{1}{2}) \mathbf{a}_3 =$	$-ay_2 \hat{\mathbf{x}} + a(z_2 + \frac{1}{2}) \hat{\mathbf{y}} - a(x_2 - \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{35} =$	$(y_2 + \frac{1}{2}) \mathbf{a}_1 - (z_2 - \frac{1}{2}) \mathbf{a}_2 - x_2 \mathbf{a}_3 =$	$a(y_2 + \frac{1}{2}) \hat{\mathbf{x}} - a(z_2 - \frac{1}{2}) \hat{\mathbf{y}} - ax_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{36} =$	$-(y_2 - \frac{1}{2}) \mathbf{a}_1 - z_2 \mathbf{a}_2 + (x_2 + \frac{1}{2}) \mathbf{a}_3 =$	$-a(y_2 - \frac{1}{2}) \hat{\mathbf{x}} - az_2 \hat{\mathbf{y}} + a(x_2 + \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{37} =$	$-x_2 \mathbf{a}_1 - y_2 \mathbf{a}_2 - z_2 \mathbf{a}_3 =$	$-ax_2 \hat{\mathbf{x}} - ay_2 \hat{\mathbf{y}} - az_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{38} =$	$(x_2 + \frac{1}{2}) \mathbf{a}_1 + y_2 \mathbf{a}_2 - (z_2 - \frac{1}{2}) \mathbf{a}_3 =$	$a(x_2 + \frac{1}{2}) \hat{\mathbf{x}} + ay_2 \hat{\mathbf{y}} - a(z_2 - \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{39} =$	$x_2 \mathbf{a}_1 - (y_2 - \frac{1}{2}) \mathbf{a}_2 + (z_2 + \frac{1}{2}) \mathbf{a}_3 =$	$ax_2 \hat{\mathbf{x}} - a(y_2 - \frac{1}{2}) \hat{\mathbf{y}} + a(z_2 + \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{40} =$	$-(x_2 - \frac{1}{2}) \mathbf{a}_1 + (y_2 + \frac{1}{2}) \mathbf{a}_2 + z_2 \mathbf{a}_3 =$	$-a(x_2 - \frac{1}{2}) \hat{\mathbf{x}} + a(y_2 + \frac{1}{2}) \hat{\mathbf{y}} + az_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{41} =$	$-z_2 \mathbf{a}_1 - x_2 \mathbf{a}_2 - y_2 \mathbf{a}_3 =$	$-az_2 \hat{\mathbf{x}} - ax_2 \hat{\mathbf{y}} - ay_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{42} =$	$-(z_2 - \frac{1}{2}) \mathbf{a}_1 + (x_2 + \frac{1}{2}) \mathbf{a}_2 + y_2 \mathbf{a}_3 =$	$-a(z_2 - \frac{1}{2}) \hat{\mathbf{x}} + a(x_2 + \frac{1}{2}) \hat{\mathbf{y}} + ay_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{43} =$	$(z_2 + \frac{1}{2}) \mathbf{a}_1 + x_2 \mathbf{a}_2 - (y_2 - \frac{1}{2}) \mathbf{a}_3 =$	$a(z_2 + \frac{1}{2}) \hat{\mathbf{x}} + ax_2 \hat{\mathbf{y}} - a(y_2 - \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{44} =$	$z_2 \mathbf{a}_1 - (x_2 - \frac{1}{2}) \mathbf{a}_2 + (y_2 + \frac{1}{2}) \mathbf{a}_3 =$	$az_2 \hat{\mathbf{x}} - a(x_2 - \frac{1}{2}) \hat{\mathbf{y}} + a(y_2 + \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{45} =$	$-y_2 \mathbf{a}_1 - z_2 \mathbf{a}_2 - x_2 \mathbf{a}_3 =$	$-ay_2 \hat{\mathbf{x}} - az_2 \hat{\mathbf{y}} - ax_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{46} =$	$y_2 \mathbf{a}_1 - (z_2 - \frac{1}{2}) \mathbf{a}_2 + (x_2 + \frac{1}{2}) \mathbf{a}_3 =$	$ay_2 \hat{\mathbf{x}} - a(z_2 - \frac{1}{2}) \hat{\mathbf{y}} + a(x_2 + \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{47} =$	$-(y_2 - \frac{1}{2}) \mathbf{a}_1 + (z_2 + \frac{1}{2}) \mathbf{a}_2 + x_2 \mathbf{a}_3 =$	$-a(y_2 - \frac{1}{2}) \hat{\mathbf{x}} + a(z_2 + \frac{1}{2}) \hat{\mathbf{y}} + ax_2 \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{48} =$	$(y_2 + \frac{1}{2}) \mathbf{a}_1 + z_2 \mathbf{a}_2 - (x_2 - \frac{1}{2}) \mathbf{a}_3 =$	$a(y_2 + \frac{1}{2}) \hat{\mathbf{x}} + az_2 \hat{\mathbf{y}} - a(x_2 - \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	C II
$\mathbf{B}_{49} =$	$x_3 \mathbf{a}_1 + y_3 \mathbf{a}_2 + z_3 \mathbf{a}_3 =$	$ax_3 \hat{\mathbf{x}} + ay_3 \hat{\mathbf{y}} + az_3 \hat{\mathbf{z}}$	(24d)	N I
$\mathbf{B}_{50} =$	$-(x_3 - \frac{1}{2}) \mathbf{a}_1 - y_3 \mathbf{a}_2 + (z_3 + \frac{1}{2}) \mathbf{a}_3 =$	$-a(x_3 - \frac{1}{2}) \hat{\mathbf{x}} - ay_3 \hat{\mathbf{y}} + a(z_3 + \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	N I
$\mathbf{B}_{51} =$	$-x_3 \mathbf{a}_1 + (y_3 + \frac{1}{2}) \mathbf{a}_2 - (z_3 - \frac{1}{2}) \mathbf{a}_3 =$	$-ax_3 \hat{\mathbf{x}} + a(y_3 + \frac{1}{2}) \hat{\mathbf{y}} - a(z_3 - \frac{1}{2}) \hat{\mathbf{z}}$	(24d)	N I
$\mathbf{B}_{52} =$	$(x_3 + \frac{1}{2}) \mathbf{a}_1 - (y_3 - \frac{1}{2}) \mathbf{a}_2 - z_3 \mathbf{a}_3 =$	$a(x_3 + \frac{1}{2}) \hat{\mathbf{x}} - a(y_3 - \frac{1}{2}) \hat{\mathbf{y}} - az_3 \hat{\mathbf{z}}$	(24d)	N I
$\mathbf{B}_{53} =$	$z_3 \mathbf{a}_1 + x_3 \mathbf{a}_2 + y_3 \mathbf{a}_3 =$	$az_3 \hat{\mathbf{x}} + ax_3 \hat{\mathbf{y}} + ay_3 \hat{\mathbf{z}}$	(24d)	N I

$$\begin{aligned}
\mathbf{B}_{54} &= (z_3 + \tfrac{1}{2}) \mathbf{a}_1 - (x_3 - \tfrac{1}{2}) \mathbf{a}_2 - y_3 \mathbf{a}_3 = a(z_3 + \tfrac{1}{2}) \hat{\mathbf{x}} - a(x_3 - \tfrac{1}{2}) \hat{\mathbf{y}} - ay_3 \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{55} &= -(z_3 - \tfrac{1}{2}) \mathbf{a}_1 - x_3 \mathbf{a}_2 + (y_3 + \tfrac{1}{2}) \mathbf{a}_3 = -a(z_3 - \tfrac{1}{2}) \hat{\mathbf{x}} - ax_3 \hat{\mathbf{y}} + a(y_3 + \tfrac{1}{2}) \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{56} &= -z_3 \mathbf{a}_1 + (x_3 + \tfrac{1}{2}) \mathbf{a}_2 - (y_3 - \tfrac{1}{2}) \mathbf{a}_3 = -az_3 \hat{\mathbf{x}} + a(x_3 + \tfrac{1}{2}) \hat{\mathbf{y}} - a(y_3 - \tfrac{1}{2}) \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{57} &= y_3 \mathbf{a}_1 + z_3 \mathbf{a}_2 + x_3 \mathbf{a}_3 = ay_3 \hat{\mathbf{x}} + az_3 \hat{\mathbf{y}} + ax_3 \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{58} &= -y_3 \mathbf{a}_1 + (z_3 + \tfrac{1}{2}) \mathbf{a}_2 - (x_3 - \tfrac{1}{2}) \mathbf{a}_3 = -ay_3 \hat{\mathbf{x}} + a(z_3 + \tfrac{1}{2}) \hat{\mathbf{y}} - a(x_3 - \tfrac{1}{2}) \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{59} &= (y_3 + \tfrac{1}{2}) \mathbf{a}_1 - (z_3 - \tfrac{1}{2}) \mathbf{a}_2 - x_3 \mathbf{a}_3 = a(y_3 + \tfrac{1}{2}) \hat{\mathbf{x}} - a(z_3 - \tfrac{1}{2}) \hat{\mathbf{y}} - ax_3 \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{60} &= -(y_3 - \tfrac{1}{2}) \mathbf{a}_1 - z_3 \mathbf{a}_2 + (x_3 + \tfrac{1}{2}) \mathbf{a}_3 = -a(y_3 - \tfrac{1}{2}) \hat{\mathbf{x}} - az_3 \hat{\mathbf{y}} + a(x_3 + \tfrac{1}{2}) \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{61} &= -x_3 \mathbf{a}_1 - y_3 \mathbf{a}_2 - z_3 \mathbf{a}_3 = -ax_3 \hat{\mathbf{x}} - ay_3 \hat{\mathbf{y}} - az_3 \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{62} &= (x_3 + \tfrac{1}{2}) \mathbf{a}_1 + y_3 \mathbf{a}_2 - (z_3 - \tfrac{1}{2}) \mathbf{a}_3 = a(x_3 + \tfrac{1}{2}) \hat{\mathbf{x}} + ay_3 \hat{\mathbf{y}} - a(z_3 - \tfrac{1}{2}) \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{63} &= x_3 \mathbf{a}_1 - (y_3 - \tfrac{1}{2}) \mathbf{a}_2 + (z_3 + \tfrac{1}{2}) \mathbf{a}_3 = ax_3 \hat{\mathbf{x}} - a(y_3 - \tfrac{1}{2}) \hat{\mathbf{y}} + a(z_3 + \tfrac{1}{2}) \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{64} &= -(x_3 - \tfrac{1}{2}) \mathbf{a}_1 + (y_3 + \tfrac{1}{2}) \mathbf{a}_2 + z_3 \mathbf{a}_3 = -a(x_3 - \tfrac{1}{2}) \hat{\mathbf{x}} + a(y_3 + \tfrac{1}{2}) \hat{\mathbf{y}} + az_3 \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{65} &= -z_3 \mathbf{a}_1 - x_3 \mathbf{a}_2 - y_3 \mathbf{a}_3 = -az_3 \hat{\mathbf{x}} - ax_3 \hat{\mathbf{y}} - ay_3 \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{66} &= -(z_3 - \tfrac{1}{2}) \mathbf{a}_1 + (x_3 + \tfrac{1}{2}) \mathbf{a}_2 + y_3 \mathbf{a}_3 = -a(z_3 - \tfrac{1}{2}) \hat{\mathbf{x}} + a(x_3 + \tfrac{1}{2}) \hat{\mathbf{y}} + ay_3 \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{67} &= (z_3 + \tfrac{1}{2}) \mathbf{a}_1 + x_3 \mathbf{a}_2 - (y_3 - \tfrac{1}{2}) \mathbf{a}_3 = a(z_3 + \tfrac{1}{2}) \hat{\mathbf{x}} + ax_3 \hat{\mathbf{y}} - a(y_3 - \tfrac{1}{2}) \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{68} &= z_3 \mathbf{a}_1 - (x_3 - \tfrac{1}{2}) \mathbf{a}_2 + (y_3 + \tfrac{1}{2}) \mathbf{a}_3 = az_3 \hat{\mathbf{x}} - a(x_3 - \tfrac{1}{2}) \hat{\mathbf{y}} + a(y_3 + \tfrac{1}{2}) \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{69} &= -y_3 \mathbf{a}_1 - z_3 \mathbf{a}_2 - x_3 \mathbf{a}_3 = -ay_3 \hat{\mathbf{x}} - az_3 \hat{\mathbf{y}} - ax_3 \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{70} &= y_3 \mathbf{a}_1 - (z_3 - \tfrac{1}{2}) \mathbf{a}_2 + (x_3 + \tfrac{1}{2}) \mathbf{a}_3 = ay_3 \hat{\mathbf{x}} - a(z_3 - \tfrac{1}{2}) \hat{\mathbf{y}} + a(x_3 + \tfrac{1}{2}) \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{71} &= -(y_3 - \tfrac{1}{2}) \mathbf{a}_1 + (z_3 + \tfrac{1}{2}) \mathbf{a}_2 + x_3 \mathbf{a}_3 = -a(y_3 - \tfrac{1}{2}) \hat{\mathbf{x}} + a(z_3 + \tfrac{1}{2}) \hat{\mathbf{y}} + ax_3 \hat{\mathbf{z}} & (24d) & \text{N I} \\
\mathbf{B}_{72} &= (y_3 + \tfrac{1}{2}) \mathbf{a}_1 + z_3 \mathbf{a}_2 - (x_3 - \tfrac{1}{2}) \mathbf{a}_3 = a(y_3 + \tfrac{1}{2}) \hat{\mathbf{x}} + az_3 \hat{\mathbf{y}} - a(x_3 - \tfrac{1}{2}) \hat{\mathbf{z}} & (24d) & \text{N I}
\end{aligned}$$

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