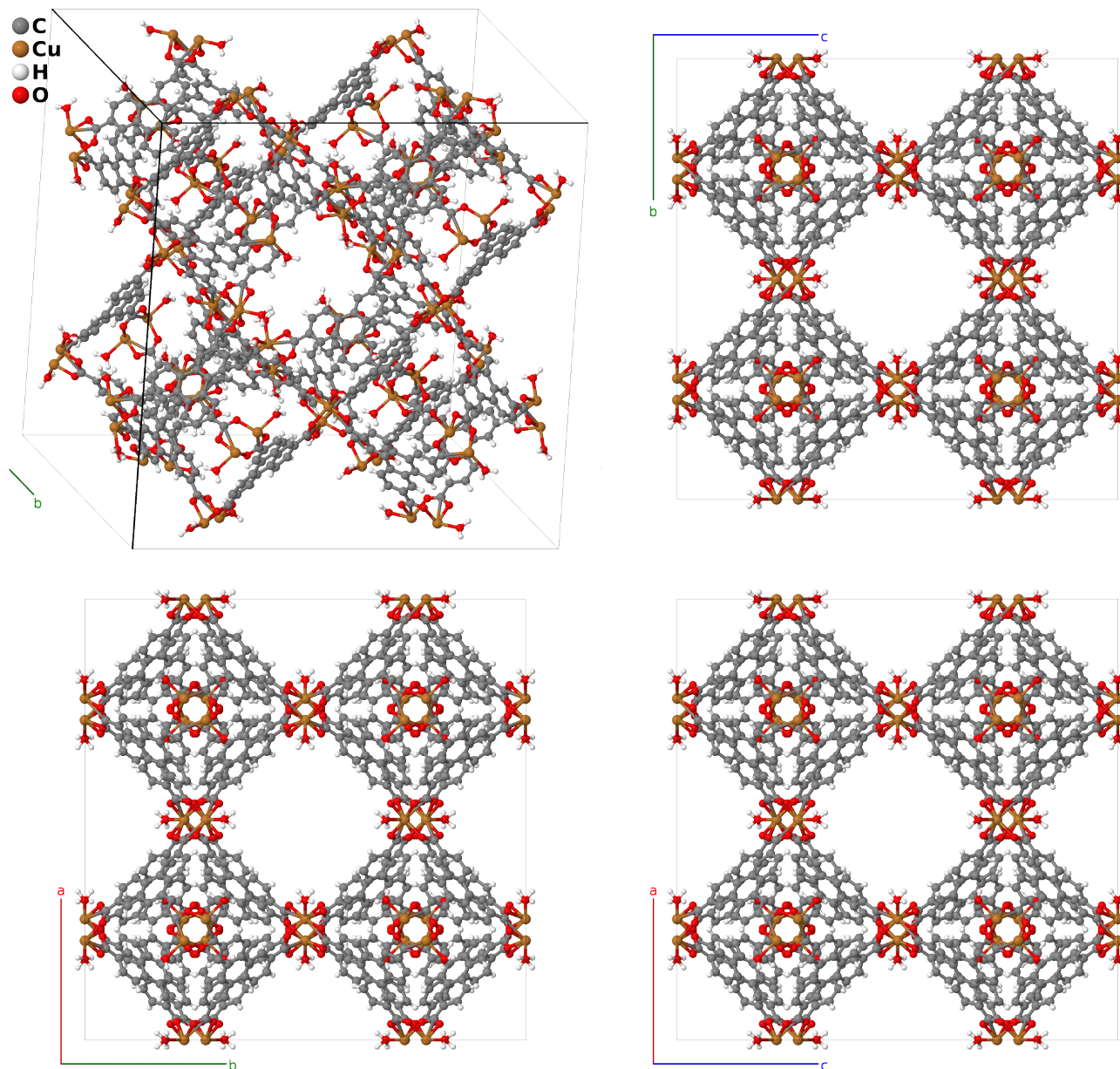


PCN-20 [C₁₄CuO(H₂O)₄] Structure: A14BC8D5_cF1344_209_7j_g_4j_g2j-001

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<https://aflow.org/p/5WNB>

https://aflow.org/p/A14BC8D5_cF1344_209_7j_g_4j_g2j-001



Prototype

C₁₄CuH₈O₅

AFLOW prototype label

A14BC8D5_cF1344_209_7j_g_4j_g2j-001

CCDC

685824

Pearson symbol

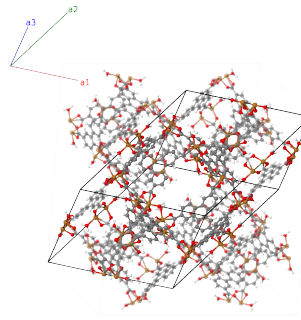
cF1344

Space group number 209
Space group symbol $F432$
AFLOW prototype command `aflow --proto=A14BC8D5_cF1344_209_7j_g_4j_g2j-001`
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- “PCN” is an acronym for “porous coordination network.”
- (Wang, 2009) list the atoms we have denoted H II as H3A and H3B, each half filled, but their two sites are identical, so we have combined them into one completely filled site.
- We shifted the origin by $1/2c\hat{z}$, moving the copper and O-I atoms from (48h) to (48g) Wyckoff positions.

Face-centered Cubic primitive vectors

$$\begin{aligned}\mathbf{a}_1 &= \frac{1}{2}a\hat{y} + \frac{1}{2}a\hat{z} \\ \mathbf{a}_2 &= \frac{1}{2}a\hat{x} + \frac{1}{2}a\hat{z} \\ \mathbf{a}_3 &= \frac{1}{2}a\hat{x} + \frac{1}{2}a\hat{y}\end{aligned}$$



Basis vectors

	Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
\mathbf{B}_1	$= 2y_1 \mathbf{a}_1$	$=$	$ay_1 \hat{y} + ay_1 \hat{z}$	(48g)	Cu I
\mathbf{B}_2	$= 2y_1 \mathbf{a}_2 - 2y_1 \mathbf{a}_3$	$=$	$-ay_1 \hat{y} + ay_1 \hat{z}$	(48g)	Cu I
\mathbf{B}_3	$= -2y_1 \mathbf{a}_2 + 2y_1 \mathbf{a}_3$	$=$	$ay_1 \hat{y} - ay_1 \hat{z}$	(48g)	Cu I
\mathbf{B}_4	$= -2y_1 \mathbf{a}_1$	$=$	$-ay_1 \hat{y} - ay_1 \hat{z}$	(48g)	Cu I
\mathbf{B}_5	$= 2y_1 \mathbf{a}_2$	$=$	$ay_1 \hat{x} + ay_1 \hat{z}$	(48g)	Cu I
\mathbf{B}_6	$= -2y_1 \mathbf{a}_1 + 2y_1 \mathbf{a}_3$	$=$	$ay_1 \hat{x} - ay_1 \hat{z}$	(48g)	Cu I
\mathbf{B}_7	$= 2y_1 \mathbf{a}_1 - 2y_1 \mathbf{a}_3$	$=$	$-ay_1 \hat{x} + ay_1 \hat{z}$	(48g)	Cu I
\mathbf{B}_8	$= -2y_1 \mathbf{a}_2$	$=$	$-ay_1 \hat{x} - ay_1 \hat{z}$	(48g)	Cu I
\mathbf{B}_9	$= 2y_1 \mathbf{a}_3$	$=$	$ay_1 \hat{x} + ay_1 \hat{y}$	(48g)	Cu I
\mathbf{B}_{10}	$= 2y_1 \mathbf{a}_1 - 2y_1 \mathbf{a}_2$	$=$	$-ay_1 \hat{x} + ay_1 \hat{y}$	(48g)	Cu I
\mathbf{B}_{11}	$= -2y_1 \mathbf{a}_1 + 2y_1 \mathbf{a}_2$	$=$	$ay_1 \hat{x} - ay_1 \hat{y}$	(48g)	Cu I
\mathbf{B}_{12}	$= -2y_1 \mathbf{a}_3$	$=$	$-ay_1 \hat{x} - ay_1 \hat{y}$	(48g)	Cu I
\mathbf{B}_{13}	$= 2y_2 \mathbf{a}_1$	$=$	$ay_2 \hat{y} + ay_2 \hat{z}$	(48g)	O I
\mathbf{B}_{14}	$= 2y_2 \mathbf{a}_2 - 2y_2 \mathbf{a}_3$	$=$	$-ay_2 \hat{y} + ay_2 \hat{z}$	(48g)	O I
\mathbf{B}_{15}	$= -2y_2 \mathbf{a}_2 + 2y_2 \mathbf{a}_3$	$=$	$ay_2 \hat{y} - ay_2 \hat{z}$	(48g)	O I
\mathbf{B}_{16}	$= -2y_2 \mathbf{a}_1$	$=$	$-ay_2 \hat{y} - ay_2 \hat{z}$	(48g)	O I
\mathbf{B}_{17}	$= 2y_2 \mathbf{a}_2$	$=$	$ay_2 \hat{x} + ay_2 \hat{z}$	(48g)	O I

$$\begin{aligned}
\mathbf{B}_{18} &= -2y_2 \mathbf{a}_1 + 2y_2 \mathbf{a}_3 &= & ay_2 \hat{\mathbf{x}} - ay_2 \hat{\mathbf{z}} & (48g) & \text{O I} \\
\mathbf{B}_{19} &= 2y_2 \mathbf{a}_1 - 2y_2 \mathbf{a}_3 &= & -ay_2 \hat{\mathbf{x}} + ay_2 \hat{\mathbf{z}} & (48g) & \text{O I} \\
\mathbf{B}_{20} &= -2y_2 \mathbf{a}_2 &= & -ay_2 \hat{\mathbf{x}} - ay_2 \hat{\mathbf{z}} & (48g) & \text{O I} \\
\mathbf{B}_{21} &= 2y_2 \mathbf{a}_3 &= & ay_2 \hat{\mathbf{x}} + ay_2 \hat{\mathbf{y}} & (48g) & \text{O I} \\
\mathbf{B}_{22} &= 2y_2 \mathbf{a}_1 - 2y_2 \mathbf{a}_2 &= & -ay_2 \hat{\mathbf{x}} + ay_2 \hat{\mathbf{y}} & (48g) & \text{O I} \\
\mathbf{B}_{23} &= -2y_2 \mathbf{a}_1 + 2y_2 \mathbf{a}_2 &= & ay_2 \hat{\mathbf{x}} - ay_2 \hat{\mathbf{y}} & (48g) & \text{O I} \\
\mathbf{B}_{24} &= -2y_2 \mathbf{a}_3 &= & -ay_2 \hat{\mathbf{x}} - ay_2 \hat{\mathbf{y}} & (48g) & \text{O I} \\
\mathbf{B}_{25} &= (-x_3 + y_3 + z_3) \mathbf{a}_1 + &= & ax_3 \hat{\mathbf{x}} + ay_3 \hat{\mathbf{y}} + az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 - y_3 + z_3) \mathbf{a}_2 + \\
& (x_3 + y_3 - z_3) \mathbf{a}_3 \\
\mathbf{B}_{26} &= (x_3 - y_3 + z_3) \mathbf{a}_1 + &= & -ax_3 \hat{\mathbf{x}} - ay_3 \hat{\mathbf{y}} + az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (-x_3 + y_3 + z_3) \mathbf{a}_2 - \\
& (x_3 + y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{27} &= (x_3 + y_3 - z_3) \mathbf{a}_1 - &= & -ax_3 \hat{\mathbf{x}} + ay_3 \hat{\mathbf{y}} - az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 + z_3) \mathbf{a}_2 + \\
& (-x_3 + y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{28} &= -(x_3 + y_3 + z_3) \mathbf{a}_1 + &= & ax_3 \hat{\mathbf{x}} - ay_3 \hat{\mathbf{y}} - az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 - z_3) \mathbf{a}_2 + \\
& (x_3 - y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{29} &= (x_3 + y_3 - z_3) \mathbf{a}_1 + &= & az_3 \hat{\mathbf{x}} + ax_3 \hat{\mathbf{y}} + ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (-x_3 + y_3 + z_3) \mathbf{a}_2 + \\
& (x_3 - y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{30} &= -(x_3 + y_3 + z_3) \mathbf{a}_1 + &= & az_3 \hat{\mathbf{x}} - ax_3 \hat{\mathbf{y}} - ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 - y_3 + z_3) \mathbf{a}_2 + \\
& (-x_3 + y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{31} &= (-x_3 + y_3 + z_3) \mathbf{a}_1 + &= & -az_3 \hat{\mathbf{x}} - ax_3 \hat{\mathbf{y}} + ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 - z_3) \mathbf{a}_2 - \\
& (x_3 + y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{32} &= (x_3 - y_3 + z_3) \mathbf{a}_1 - &= & -az_3 \hat{\mathbf{x}} + ax_3 \hat{\mathbf{y}} - ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 + z_3) \mathbf{a}_2 + \\
& (x_3 + y_3 - z_3) \mathbf{a}_3 \\
\mathbf{B}_{33} &= (x_3 - y_3 + z_3) \mathbf{a}_1 + &= & ay_3 \hat{\mathbf{x}} + az_3 \hat{\mathbf{y}} + ax_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 - z_3) \mathbf{a}_2 + \\
& (-x_3 + y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{34} &= (-x_3 + y_3 + z_3) \mathbf{a}_1 - &= & -ay_3 \hat{\mathbf{x}} + az_3 \hat{\mathbf{y}} - ax_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 + z_3) \mathbf{a}_2 + \\
& (x_3 - y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{35} &= -(x_3 + y_3 + z_3) \mathbf{a}_1 + &= & ay_3 \hat{\mathbf{x}} - az_3 \hat{\mathbf{y}} - ax_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (-x_3 + y_3 + z_3) \mathbf{a}_2 + \\
& (x_3 + y_3 - z_3) \mathbf{a}_3 \\
\mathbf{B}_{36} &= (x_3 + y_3 - z_3) \mathbf{a}_1 + &= & -ay_3 \hat{\mathbf{x}} - az_3 \hat{\mathbf{y}} + ax_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 - y_3 + z_3) \mathbf{a}_2 - \\
& (x_3 + y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{37} &= (x_3 - y_3 - z_3) \mathbf{a}_1 - &= & ay_3 \hat{\mathbf{x}} + ax_3 \hat{\mathbf{y}} - az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 - y_3 + z_3) \mathbf{a}_2 + \\
& (x_3 + y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{38} &= -(x_3 - y_3 + z_3) \mathbf{a}_1 + &= & -ay_3 \hat{\mathbf{x}} - ax_3 \hat{\mathbf{y}} - az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 - y_3 - z_3) \mathbf{a}_2 - \\
& (x_3 + y_3 - z_3) \mathbf{a}_3
\end{aligned}$$

$$\begin{aligned}
\mathbf{B}_{39} &= - (x_3 + y_3 - z_3) \mathbf{a}_1 + &= & ay_3 \hat{\mathbf{x}} - ax_3 \hat{\mathbf{y}} + az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 + z_3) \mathbf{a}_2 - \\
& (x_3 - y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{40} &= (x_3 + y_3 + z_3) \mathbf{a}_1 - &= & -ay_3 \hat{\mathbf{x}} + ax_3 \hat{\mathbf{y}} + az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 - z_3) \mathbf{a}_2 + \\
& (x_3 - y_3 - z_3) \mathbf{a}_3 \\
\mathbf{B}_{41} &= - (x_3 + y_3 - z_3) \mathbf{a}_1 + &= & ax_3 \hat{\mathbf{x}} + az_3 \hat{\mathbf{y}} - ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 - y_3 - z_3) \mathbf{a}_2 + \\
& (x_3 + y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{42} &= (x_3 + y_3 + z_3) \mathbf{a}_1 - &= & -ax_3 \hat{\mathbf{x}} + az_3 \hat{\mathbf{y}} + ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 - y_3 + z_3) \mathbf{a}_2 - \\
& (x_3 + y_3 - z_3) \mathbf{a}_3 \\
\mathbf{B}_{43} &= (x_3 - y_3 - z_3) \mathbf{a}_1 - &= & -ax_3 \hat{\mathbf{x}} - az_3 \hat{\mathbf{y}} - ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 - z_3) \mathbf{a}_2 - \\
& (x_3 - y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{44} &= - (x_3 - y_3 + z_3) \mathbf{a}_1 + &= & ax_3 \hat{\mathbf{x}} - az_3 \hat{\mathbf{y}} + ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 + z_3) \mathbf{a}_2 + \\
& (x_3 - y_3 - z_3) \mathbf{a}_3 \\
\mathbf{B}_{45} &= - (x_3 - y_3 + z_3) \mathbf{a}_1 - &= & az_3 \hat{\mathbf{x}} + ay_3 \hat{\mathbf{y}} - ax_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 - z_3) \mathbf{a}_2 + \\
& (x_3 + y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{46} &= (x_3 - y_3 - z_3) \mathbf{a}_1 + &= & az_3 \hat{\mathbf{x}} - ay_3 \hat{\mathbf{y}} + ax_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 + y_3 + z_3) \mathbf{a}_2 - \\
& (x_3 + y_3 - z_3) \mathbf{a}_3 \\
\mathbf{B}_{47} &= (x_3 + y_3 + z_3) \mathbf{a}_1 + &= & -az_3 \hat{\mathbf{x}} + ay_3 \hat{\mathbf{y}} + ax_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 - y_3 - z_3) \mathbf{a}_2 - \\
& (x_3 - y_3 + z_3) \mathbf{a}_3 \\
\mathbf{B}_{48} &= - (x_3 + y_3 - z_3) \mathbf{a}_1 - &= & -az_3 \hat{\mathbf{x}} - ay_3 \hat{\mathbf{y}} - ax_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
& (x_3 - y_3 + z_3) \mathbf{a}_2 + \\
& (x_3 - y_3 - z_3) \mathbf{a}_3 \\
\mathbf{B}_{49} &= (-x_4 + y_4 + z_4) \mathbf{a}_1 + &= & ax_4 \hat{\mathbf{x}} + ay_4 \hat{\mathbf{y}} + az_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
& (x_4 - y_4 + z_4) \mathbf{a}_2 + \\
& (x_4 + y_4 - z_4) \mathbf{a}_3 \\
\mathbf{B}_{50} &= (x_4 - y_4 + z_4) \mathbf{a}_1 + &= & -ax_4 \hat{\mathbf{x}} - ay_4 \hat{\mathbf{y}} + az_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
& (-x_4 + y_4 + z_4) \mathbf{a}_2 - \\
& (x_4 + y_4 + z_4) \mathbf{a}_3 \\
\mathbf{B}_{51} &= (x_4 + y_4 - z_4) \mathbf{a}_1 - &= & -ax_4 \hat{\mathbf{x}} + ay_4 \hat{\mathbf{y}} - az_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
& (x_4 + y_4 + z_4) \mathbf{a}_2 + \\
& (-x_4 + y_4 + z_4) \mathbf{a}_3 \\
\mathbf{B}_{52} &= - (x_4 + y_4 + z_4) \mathbf{a}_1 + &= & ax_4 \hat{\mathbf{x}} - ay_4 \hat{\mathbf{y}} - az_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
& (x_4 + y_4 - z_4) \mathbf{a}_2 + \\
& (x_4 - y_4 + z_4) \mathbf{a}_3 \\
\mathbf{B}_{53} &= (x_4 + y_4 - z_4) \mathbf{a}_1 + &= & az_4 \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} + ay_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
& (-x_4 + y_4 + z_4) \mathbf{a}_2 + \\
& (x_4 - y_4 + z_4) \mathbf{a}_3 \\
\mathbf{B}_{54} &= - (x_4 + y_4 + z_4) \mathbf{a}_1 + &= & az_4 \hat{\mathbf{x}} - ax_4 \hat{\mathbf{y}} - ay_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
& (x_4 - y_4 + z_4) \mathbf{a}_2 + \\
& (-x_4 + y_4 + z_4) \mathbf{a}_3 \\
\mathbf{B}_{55} &= (-x_4 + y_4 + z_4) \mathbf{a}_1 + &= & -az_4 \hat{\mathbf{x}} - ax_4 \hat{\mathbf{y}} + ay_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
& (x_4 + y_4 - z_4) \mathbf{a}_2 - \\
& (x_4 + y_4 + z_4) \mathbf{a}_3
\end{aligned}$$

$$\begin{aligned}
\mathbf{B}_{56} &= \begin{pmatrix} (x_4 - y_4 + z_4) \mathbf{a}_1 - \\ (x_4 + y_4 + z_4) \mathbf{a}_2 + \\ (x_4 + y_4 - z_4) \mathbf{a}_3 \end{pmatrix} = -az_4 \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} - ay_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{57} &= \begin{pmatrix} (x_4 - y_4 + z_4) \mathbf{a}_1 + \\ (x_4 + y_4 - z_4) \mathbf{a}_2 + \\ (-x_4 + y_4 + z_4) \mathbf{a}_3 \end{pmatrix} = ay_4 \hat{\mathbf{x}} + az_4 \hat{\mathbf{y}} + ax_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{58} &= \begin{pmatrix} (-x_4 + y_4 + z_4) \mathbf{a}_1 - \\ (x_4 + y_4 + z_4) \mathbf{a}_2 + \\ (x_4 - y_4 + z_4) \mathbf{a}_3 \end{pmatrix} = -ay_4 \hat{\mathbf{x}} + az_4 \hat{\mathbf{y}} - ax_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{59} &= \begin{pmatrix} -(x_4 + y_4 + z_4) \mathbf{a}_1 + \\ (-x_4 + y_4 + z_4) \mathbf{a}_2 + \\ (x_4 + y_4 - z_4) \mathbf{a}_3 \end{pmatrix} = ay_4 \hat{\mathbf{x}} - az_4 \hat{\mathbf{y}} - ax_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{60} &= \begin{pmatrix} (x_4 + y_4 - z_4) \mathbf{a}_1 + \\ (x_4 - y_4 + z_4) \mathbf{a}_2 - \\ (x_4 + y_4 + z_4) \mathbf{a}_3 \end{pmatrix} = -ay_4 \hat{\mathbf{x}} - az_4 \hat{\mathbf{y}} + ax_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{61} &= \begin{pmatrix} (x_4 - y_4 - z_4) \mathbf{a}_1 - \\ (x_4 - y_4 + z_4) \mathbf{a}_2 + \\ (x_4 + y_4 + z_4) \mathbf{a}_3 \end{pmatrix} = ay_4 \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} - az_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{62} &= \begin{pmatrix} -(x_4 - y_4 + z_4) \mathbf{a}_1 + \\ (x_4 - y_4 - z_4) \mathbf{a}_2 - \\ (x_4 + y_4 - z_4) \mathbf{a}_3 \end{pmatrix} = -ay_4 \hat{\mathbf{x}} - ax_4 \hat{\mathbf{y}} - az_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{63} &= \begin{pmatrix} -(x_4 + y_4 - z_4) \mathbf{a}_1 + \\ (x_4 + y_4 + z_4) \mathbf{a}_2 - \\ (x_4 - y_4 + z_4) \mathbf{a}_3 \end{pmatrix} = ay_4 \hat{\mathbf{x}} - ax_4 \hat{\mathbf{y}} + az_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{64} &= \begin{pmatrix} (x_4 + y_4 + z_4) \mathbf{a}_1 - \\ (x_4 + y_4 - z_4) \mathbf{a}_2 + \\ (x_4 - y_4 - z_4) \mathbf{a}_3 \end{pmatrix} = -ay_4 \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} + az_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{65} &= \begin{pmatrix} -(x_4 + y_4 - z_4) \mathbf{a}_1 + \\ (x_4 - y_4 - z_4) \mathbf{a}_2 + \\ (x_4 + y_4 + z_4) \mathbf{a}_3 \end{pmatrix} = ax_4 \hat{\mathbf{x}} + az_4 \hat{\mathbf{y}} - ay_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{66} &= \begin{pmatrix} (x_4 + y_4 + z_4) \mathbf{a}_1 - \\ (x_4 - y_4 + z_4) \mathbf{a}_2 - \\ (x_4 + y_4 - z_4) \mathbf{a}_3 \end{pmatrix} = -ax_4 \hat{\mathbf{x}} + az_4 \hat{\mathbf{y}} + ay_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{67} &= \begin{pmatrix} (x_4 - y_4 - z_4) \mathbf{a}_1 - \\ (x_4 + y_4 - z_4) \mathbf{a}_2 - \\ (x_4 - y_4 + z_4) \mathbf{a}_3 \end{pmatrix} = -ax_4 \hat{\mathbf{x}} - az_4 \hat{\mathbf{y}} - ay_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{68} &= \begin{pmatrix} -(x_4 - y_4 + z_4) \mathbf{a}_1 + \\ (x_4 + y_4 + z_4) \mathbf{a}_2 + \\ (x_4 - y_4 - z_4) \mathbf{a}_3 \end{pmatrix} = ax_4 \hat{\mathbf{x}} - az_4 \hat{\mathbf{y}} + ay_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{69} &= \begin{pmatrix} -(x_4 - y_4 + z_4) \mathbf{a}_1 - \\ (x_4 + y_4 - z_4) \mathbf{a}_2 + \\ (x_4 + y_4 + z_4) \mathbf{a}_3 \end{pmatrix} = az_4 \hat{\mathbf{x}} + ay_4 \hat{\mathbf{y}} - ax_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{70} &= \begin{pmatrix} (x_4 - y_4 - z_4) \mathbf{a}_1 + \\ (x_4 + y_4 + z_4) \mathbf{a}_2 - \\ (x_4 + y_4 - z_4) \mathbf{a}_3 \end{pmatrix} = az_4 \hat{\mathbf{x}} - ay_4 \hat{\mathbf{y}} + ax_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{71} &= \begin{pmatrix} (x_4 + y_4 + z_4) \mathbf{a}_1 + \\ (x_4 - y_4 - z_4) \mathbf{a}_2 - \\ (x_4 - y_4 + z_4) \mathbf{a}_3 \end{pmatrix} = -az_4 \hat{\mathbf{x}} + ay_4 \hat{\mathbf{y}} + ax_4 \hat{\mathbf{z}} & (96j) & \text{C II} \\
\mathbf{B}_{72} &= \begin{pmatrix} -(x_4 + y_4 - z_4) \mathbf{a}_1 - \\ (x_4 - y_4 + z_4) \mathbf{a}_2 + \\ (x_4 - y_4 - z_4) \mathbf{a}_3 \end{pmatrix} = -az_4 \hat{\mathbf{x}} - ay_4 \hat{\mathbf{y}} - ax_4 \hat{\mathbf{z}} & (96j) & \text{C II}
\end{aligned}$$

$$\begin{aligned}
\mathbf{B}_{73} &= \begin{pmatrix} (-x_5 + y_5 + z_5) \mathbf{a}_1 + \\ (x_5 - y_5 + z_5) \mathbf{a}_2 + \\ (x_5 + y_5 - z_5) \mathbf{a}_3 \end{pmatrix} = ax_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} + az_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{74} &= \begin{pmatrix} (x_5 - y_5 + z_5) \mathbf{a}_1 + \\ (-x_5 + y_5 + z_5) \mathbf{a}_2 - \\ (x_5 + y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = -ax_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} + az_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{75} &= \begin{pmatrix} (x_5 + y_5 - z_5) \mathbf{a}_1 - \\ (x_5 + y_5 + z_5) \mathbf{a}_2 + \\ (-x_5 + y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = -ax_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} - az_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{76} &= \begin{pmatrix} -(x_5 + y_5 + z_5) \mathbf{a}_1 + \\ (x_5 + y_5 - z_5) \mathbf{a}_2 + \\ (x_5 - y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = ax_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} - az_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{77} &= \begin{pmatrix} (x_5 + y_5 - z_5) \mathbf{a}_1 + \\ (-x_5 + y_5 + z_5) \mathbf{a}_2 + \\ (x_5 - y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = az_5 \hat{\mathbf{x}} + ax_5 \hat{\mathbf{y}} + ay_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{78} &= \begin{pmatrix} -(x_5 + y_5 + z_5) \mathbf{a}_1 + \\ (x_5 - y_5 + z_5) \mathbf{a}_2 + \\ (-x_5 + y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = az_5 \hat{\mathbf{x}} - ax_5 \hat{\mathbf{y}} - ay_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{79} &= \begin{pmatrix} (-x_5 + y_5 + z_5) \mathbf{a}_1 + \\ (x_5 + y_5 - z_5) \mathbf{a}_2 - \\ (x_5 + y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = -az_5 \hat{\mathbf{x}} - ax_5 \hat{\mathbf{y}} + ay_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{80} &= \begin{pmatrix} (x_5 - y_5 + z_5) \mathbf{a}_1 - \\ (x_5 + y_5 + z_5) \mathbf{a}_2 + \\ (x_5 + y_5 - z_5) \mathbf{a}_3 \end{pmatrix} = -az_5 \hat{\mathbf{x}} + ax_5 \hat{\mathbf{y}} - ay_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{81} &= \begin{pmatrix} (x_5 - y_5 + z_5) \mathbf{a}_1 + \\ (x_5 + y_5 - z_5) \mathbf{a}_2 + \\ (-x_5 + y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = ay_5 \hat{\mathbf{x}} + az_5 \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{82} &= \begin{pmatrix} (-x_5 + y_5 + z_5) \mathbf{a}_1 - \\ (x_5 + y_5 + z_5) \mathbf{a}_2 + \\ (x_5 - y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = -ay_5 \hat{\mathbf{x}} + az_5 \hat{\mathbf{y}} - ax_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{83} &= \begin{pmatrix} -(x_5 + y_5 + z_5) \mathbf{a}_1 + \\ (-x_5 + y_5 + z_5) \mathbf{a}_2 + \\ (x_5 + y_5 - z_5) \mathbf{a}_3 \end{pmatrix} = ay_5 \hat{\mathbf{x}} - az_5 \hat{\mathbf{y}} - ax_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{84} &= \begin{pmatrix} (x_5 + y_5 - z_5) \mathbf{a}_1 + \\ (x_5 - y_5 + z_5) \mathbf{a}_2 - \\ (x_5 + y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = -ay_5 \hat{\mathbf{x}} - az_5 \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{85} &= \begin{pmatrix} (x_5 - y_5 - z_5) \mathbf{a}_1 - \\ (x_5 - y_5 + z_5) \mathbf{a}_2 + \\ (x_5 + y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = ay_5 \hat{\mathbf{x}} + ax_5 \hat{\mathbf{y}} - az_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{86} &= \begin{pmatrix} -(x_5 - y_5 + z_5) \mathbf{a}_1 + \\ (x_5 - y_5 - z_5) \mathbf{a}_2 - \\ (x_5 + y_5 - z_5) \mathbf{a}_3 \end{pmatrix} = -ay_5 \hat{\mathbf{x}} - ax_5 \hat{\mathbf{y}} - az_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{87} &= \begin{pmatrix} -(x_5 + y_5 - z_5) \mathbf{a}_1 + \\ (x_5 + y_5 + z_5) \mathbf{a}_2 - \\ (x_5 - y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = ay_5 \hat{\mathbf{x}} - ax_5 \hat{\mathbf{y}} + az_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{88} &= \begin{pmatrix} (x_5 + y_5 + z_5) \mathbf{a}_1 - \\ (x_5 + y_5 - z_5) \mathbf{a}_2 + \\ (x_5 - y_5 - z_5) \mathbf{a}_3 \end{pmatrix} = -ay_5 \hat{\mathbf{x}} + ax_5 \hat{\mathbf{y}} + az_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{89} &= \begin{pmatrix} -(x_5 + y_5 - z_5) \mathbf{a}_1 + \\ (x_5 - y_5 - z_5) \mathbf{a}_2 + \\ (x_5 + y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = ax_5 \hat{\mathbf{x}} + az_5 \hat{\mathbf{y}} - ay_5 \hat{\mathbf{z}} & (96j) & \text{C III}
\end{aligned}$$

$$\begin{aligned}
\mathbf{B}_{90} &= \begin{pmatrix} (x_5 + y_5 + z_5) \mathbf{a}_1 - \\ (x_5 - y_5 + z_5) \mathbf{a}_2 - \\ (x_5 + y_5 - z_5) \mathbf{a}_3 \end{pmatrix} = -ax_5 \hat{\mathbf{x}} + az_5 \hat{\mathbf{y}} + ay_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{91} &= \begin{pmatrix} (x_5 - y_5 - z_5) \mathbf{a}_1 - \\ (x_5 + y_5 - z_5) \mathbf{a}_2 - \\ (x_5 - y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = -ax_5 \hat{\mathbf{x}} - az_5 \hat{\mathbf{y}} - ay_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{92} &= \begin{pmatrix} -(x_5 - y_5 + z_5) \mathbf{a}_1 + \\ (x_5 + y_5 + z_5) \mathbf{a}_2 + \\ (x_5 - y_5 - z_5) \mathbf{a}_3 \end{pmatrix} = ax_5 \hat{\mathbf{x}} - az_5 \hat{\mathbf{y}} + ay_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{93} &= \begin{pmatrix} -(x_5 - y_5 + z_5) \mathbf{a}_1 - \\ (x_5 + y_5 - z_5) \mathbf{a}_2 + \\ (x_5 + y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = az_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} - ax_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{94} &= \begin{pmatrix} (x_5 - y_5 - z_5) \mathbf{a}_1 + \\ (x_5 + y_5 + z_5) \mathbf{a}_2 - \\ (x_5 + y_5 - z_5) \mathbf{a}_3 \end{pmatrix} = az_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{95} &= \begin{pmatrix} (x_5 + y_5 + z_5) \mathbf{a}_1 + \\ (x_5 - y_5 - z_5) \mathbf{a}_2 - \\ (x_5 - y_5 + z_5) \mathbf{a}_3 \end{pmatrix} = -az_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{96} &= \begin{pmatrix} -(x_5 + y_5 - z_5) \mathbf{a}_1 - \\ (x_5 - y_5 + z_5) \mathbf{a}_2 + \\ (x_5 - y_5 - z_5) \mathbf{a}_3 \end{pmatrix} = -az_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} - ax_5 \hat{\mathbf{z}} & (96j) & \text{C III} \\
\mathbf{B}_{97} &= \begin{pmatrix} (-x_6 + y_6 + z_6) \mathbf{a}_1 + \\ (x_6 - y_6 + z_6) \mathbf{a}_2 + \\ (x_6 + y_6 - z_6) \mathbf{a}_3 \end{pmatrix} = ax_6 \hat{\mathbf{x}} + ay_6 \hat{\mathbf{y}} + az_6 \hat{\mathbf{z}} & (96j) & \text{C IV} \\
\mathbf{B}_{98} &= \begin{pmatrix} (x_6 - y_6 + z_6) \mathbf{a}_1 + \\ (-x_6 + y_6 + z_6) \mathbf{a}_2 - \\ (x_6 + y_6 + z_6) \mathbf{a}_3 \end{pmatrix} = -ax_6 \hat{\mathbf{x}} - ay_6 \hat{\mathbf{y}} + az_6 \hat{\mathbf{z}} & (96j) & \text{C IV} \\
\mathbf{B}_{99} &= \begin{pmatrix} (x_6 + y_6 - z_6) \mathbf{a}_1 - \\ (x_6 + y_6 + z_6) \mathbf{a}_2 + \\ (-x_6 + y_6 + z_6) \mathbf{a}_3 \end{pmatrix} = -ax_6 \hat{\mathbf{x}} + ay_6 \hat{\mathbf{y}} - az_6 \hat{\mathbf{z}} & (96j) & \text{C IV} \\
\mathbf{B}_{100} &= \begin{pmatrix} -(x_6 + y_6 + z_6) \mathbf{a}_1 + \\ (x_6 + y_6 - z_6) \mathbf{a}_2 + \\ (x_6 - y_6 + z_6) \mathbf{a}_3 \end{pmatrix} = ax_6 \hat{\mathbf{x}} - ay_6 \hat{\mathbf{y}} - az_6 \hat{\mathbf{z}} & (96j) & \text{C IV} \\
\mathbf{B}_{101} &= \begin{pmatrix} (x_6 + y_6 - z_6) \mathbf{a}_1 + \\ (-x_6 + y_6 + z_6) \mathbf{a}_2 + \\ (x_6 - y_6 + z_6) \mathbf{a}_3 \end{pmatrix} = az_6 \hat{\mathbf{x}} + ax_6 \hat{\mathbf{y}} + ay_6 \hat{\mathbf{z}} & (96j) & \text{C IV} \\
\mathbf{B}_{102} &= \begin{pmatrix} -(x_6 + y_6 + z_6) \mathbf{a}_1 + \\ (x_6 - y_6 + z_6) \mathbf{a}_2 + \\ (-x_6 + y_6 + z_6) \mathbf{a}_3 \end{pmatrix} = az_6 \hat{\mathbf{x}} - ax_6 \hat{\mathbf{y}} - ay_6 \hat{\mathbf{z}} & (96j) & \text{C IV} \\
\mathbf{B}_{103} &= \begin{pmatrix} (-x_6 + y_6 + z_6) \mathbf{a}_1 + \\ (x_6 + y_6 - z_6) \mathbf{a}_2 - \\ (x_6 + y_6 + z_6) \mathbf{a}_3 \end{pmatrix} = -az_6 \hat{\mathbf{x}} - ax_6 \hat{\mathbf{y}} + ay_6 \hat{\mathbf{z}} & (96j) & \text{C IV} \\
\mathbf{B}_{104} &= \begin{pmatrix} (x_6 - y_6 + z_6) \mathbf{a}_1 - \\ (x_6 + y_6 + z_6) \mathbf{a}_2 + \\ (x_6 + y_6 - z_6) \mathbf{a}_3 \end{pmatrix} = -az_6 \hat{\mathbf{x}} + ax_6 \hat{\mathbf{y}} - ay_6 \hat{\mathbf{z}} & (96j) & \text{C IV} \\
\mathbf{B}_{105} &= \begin{pmatrix} (x_6 - y_6 + z_6) \mathbf{a}_1 + \\ (x_6 + y_6 - z_6) \mathbf{a}_2 + \\ (-x_6 + y_6 + z_6) \mathbf{a}_3 \end{pmatrix} = ay_6 \hat{\mathbf{x}} + az_6 \hat{\mathbf{y}} + ax_6 \hat{\mathbf{z}} & (96j) & \text{C IV} \\
\mathbf{B}_{106} &= \begin{pmatrix} (-x_6 + y_6 + z_6) \mathbf{a}_1 - \\ (x_6 + y_6 + z_6) \mathbf{a}_2 + \\ (x_6 - y_6 + z_6) \mathbf{a}_3 \end{pmatrix} = -ay_6 \hat{\mathbf{x}} + az_6 \hat{\mathbf{y}} - ax_6 \hat{\mathbf{z}} & (96j) & \text{C IV}
\end{aligned}$$

$$\begin{aligned}
\mathbf{B}_{141} &= \begin{aligned} &-(x_7 - y_7 + z_7) \mathbf{a}_1 - \\ &(x_7 + y_7 - z_7) \mathbf{a}_2 + \\ &(x_7 + y_7 + z_7) \mathbf{a}_3 \end{aligned} &= &az_7 \hat{\mathbf{x}} + ay_7 \hat{\mathbf{y}} - ax_7 \hat{\mathbf{z}} &(96j) &C V \\
\mathbf{B}_{142} &= \begin{aligned} &(x_7 - y_7 - z_7) \mathbf{a}_1 + \\ &(x_7 + y_7 + z_7) \mathbf{a}_2 - \\ &(x_7 + y_7 - z_7) \mathbf{a}_3 \end{aligned} &= &az_7 \hat{\mathbf{x}} - ay_7 \hat{\mathbf{y}} + ax_7 \hat{\mathbf{z}} &(96j) &C V \\
\mathbf{B}_{143} &= \begin{aligned} &(x_7 + y_7 + z_7) \mathbf{a}_1 + \\ &(x_7 - y_7 - z_7) \mathbf{a}_2 - \\ &(x_7 - y_7 + z_7) \mathbf{a}_3 \end{aligned} &= &-az_7 \hat{\mathbf{x}} + ay_7 \hat{\mathbf{y}} + ax_7 \hat{\mathbf{z}} &(96j) &C V \\
\mathbf{B}_{144} &= \begin{aligned} &-(x_7 + y_7 - z_7) \mathbf{a}_1 - \\ &(x_7 - y_7 + z_7) \mathbf{a}_2 + \\ &(x_7 - y_7 - z_7) \mathbf{a}_3 \end{aligned} &= &-az_7 \hat{\mathbf{x}} - ay_7 \hat{\mathbf{y}} - ax_7 \hat{\mathbf{z}} &(96j) &C V \\
\mathbf{B}_{145} &= \begin{aligned} &(-x_8 + y_8 + z_8) \mathbf{a}_1 + \\ &(x_8 - y_8 + z_8) \mathbf{a}_2 + \\ &(x_8 + y_8 - z_8) \mathbf{a}_3 \end{aligned} &= &ax_8 \hat{\mathbf{x}} + ay_8 \hat{\mathbf{y}} + az_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{146} &= \begin{aligned} &(x_8 - y_8 + z_8) \mathbf{a}_1 + \\ &(-x_8 + y_8 + z_8) \mathbf{a}_2 - \\ &(x_8 + y_8 + z_8) \mathbf{a}_3 \end{aligned} &= &-ax_8 \hat{\mathbf{x}} - ay_8 \hat{\mathbf{y}} + az_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{147} &= \begin{aligned} &(x_8 + y_8 - z_8) \mathbf{a}_1 - \\ &(x_8 + y_8 + z_8) \mathbf{a}_2 + \\ &(-x_8 + y_8 + z_8) \mathbf{a}_3 \end{aligned} &= &-ax_8 \hat{\mathbf{x}} + ay_8 \hat{\mathbf{y}} - az_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{148} &= \begin{aligned} &-(x_8 + y_8 + z_8) \mathbf{a}_1 + \\ &(x_8 + y_8 - z_8) \mathbf{a}_2 + \\ &(x_8 - y_8 + z_8) \mathbf{a}_3 \end{aligned} &= &ax_8 \hat{\mathbf{x}} - ay_8 \hat{\mathbf{y}} - az_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{149} &= \begin{aligned} &(x_8 + y_8 - z_8) \mathbf{a}_1 + \\ &(-x_8 + y_8 + z_8) \mathbf{a}_2 + \\ &(x_8 - y_8 + z_8) \mathbf{a}_3 \end{aligned} &= &az_8 \hat{\mathbf{x}} + ax_8 \hat{\mathbf{y}} + ay_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{150} &= \begin{aligned} &-(x_8 + y_8 + z_8) \mathbf{a}_1 + \\ &(x_8 - y_8 + z_8) \mathbf{a}_2 + \\ &(-x_8 + y_8 + z_8) \mathbf{a}_3 \end{aligned} &= &az_8 \hat{\mathbf{x}} - ax_8 \hat{\mathbf{y}} - ay_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{151} &= \begin{aligned} &(-x_8 + y_8 + z_8) \mathbf{a}_1 + \\ &(x_8 + y_8 - z_8) \mathbf{a}_2 - \\ &(x_8 + y_8 + z_8) \mathbf{a}_3 \end{aligned} &= &-az_8 \hat{\mathbf{x}} - ax_8 \hat{\mathbf{y}} + ay_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{152} &= \begin{aligned} &(x_8 - y_8 + z_8) \mathbf{a}_1 - \\ &(x_8 + y_8 + z_8) \mathbf{a}_2 + \\ &(x_8 + y_8 - z_8) \mathbf{a}_3 \end{aligned} &= &-az_8 \hat{\mathbf{x}} + ax_8 \hat{\mathbf{y}} - ay_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{153} &= \begin{aligned} &(x_8 - y_8 + z_8) \mathbf{a}_1 + \\ &(x_8 + y_8 - z_8) \mathbf{a}_2 + \\ &(-x_8 + y_8 + z_8) \mathbf{a}_3 \end{aligned} &= &ay_8 \hat{\mathbf{x}} + az_8 \hat{\mathbf{y}} + ax_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{154} &= \begin{aligned} &(-x_8 + y_8 + z_8) \mathbf{a}_1 - \\ &(x_8 + y_8 + z_8) \mathbf{a}_2 + \\ &(x_8 - y_8 + z_8) \mathbf{a}_3 \end{aligned} &= &-ay_8 \hat{\mathbf{x}} + az_8 \hat{\mathbf{y}} - ax_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{155} &= \begin{aligned} &-(x_8 + y_8 + z_8) \mathbf{a}_1 + \\ &(-x_8 + y_8 + z_8) \mathbf{a}_2 + \\ &(x_8 + y_8 - z_8) \mathbf{a}_3 \end{aligned} &= &ay_8 \hat{\mathbf{x}} - az_8 \hat{\mathbf{y}} - ax_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{156} &= \begin{aligned} &(x_8 + y_8 - z_8) \mathbf{a}_1 + \\ &(x_8 - y_8 + z_8) \mathbf{a}_2 - \\ &(x_8 + y_8 + z_8) \mathbf{a}_3 \end{aligned} &= &-ay_8 \hat{\mathbf{x}} - az_8 \hat{\mathbf{y}} + ax_8 \hat{\mathbf{z}} &(96j) &C VI \\
\mathbf{B}_{157} &= \begin{aligned} &(x_8 - y_8 - z_8) \mathbf{a}_1 - \\ &(x_8 - y_8 + z_8) \mathbf{a}_2 + \\ &(x_8 + y_8 + z_8) \mathbf{a}_3 \end{aligned} &= &ay_8 \hat{\mathbf{x}} + ax_8 \hat{\mathbf{y}} - az_8 \hat{\mathbf{z}} &(96j) &C VI
\end{aligned}$$

$$\begin{aligned}
\mathbf{B}_{175} &= \begin{pmatrix} (-x_9 + y_9 + z_9) \mathbf{a}_1 + \\ (x_9 + y_9 - z_9) \mathbf{a}_2 - \\ (x_9 + y_9 + z_9) \mathbf{a}_3 \end{pmatrix} = -az_9 \hat{\mathbf{x}} - ax_9 \hat{\mathbf{y}} + ay_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{176} &= \begin{pmatrix} (x_9 - y_9 + z_9) \mathbf{a}_1 - \\ (x_9 + y_9 + z_9) \mathbf{a}_2 + \\ (x_9 + y_9 - z_9) \mathbf{a}_3 \end{pmatrix} = -az_9 \hat{\mathbf{x}} + ax_9 \hat{\mathbf{y}} - ay_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{177} &= \begin{pmatrix} (x_9 - y_9 + z_9) \mathbf{a}_1 + \\ (x_9 + y_9 - z_9) \mathbf{a}_2 + \\ (-x_9 + y_9 + z_9) \mathbf{a}_3 \end{pmatrix} = ay_9 \hat{\mathbf{x}} + az_9 \hat{\mathbf{y}} + ax_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{178} &= \begin{pmatrix} (-x_9 + y_9 + z_9) \mathbf{a}_1 - \\ (x_9 + y_9 + z_9) \mathbf{a}_2 + \\ (x_9 - y_9 + z_9) \mathbf{a}_3 \end{pmatrix} = -ay_9 \hat{\mathbf{x}} + az_9 \hat{\mathbf{y}} - ax_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{179} &= \begin{pmatrix} -(x_9 + y_9 + z_9) \mathbf{a}_1 + \\ (-x_9 + y_9 + z_9) \mathbf{a}_2 + \\ (x_9 + y_9 - z_9) \mathbf{a}_3 \end{pmatrix} = ay_9 \hat{\mathbf{x}} - az_9 \hat{\mathbf{y}} - ax_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{180} &= \begin{pmatrix} (x_9 + y_9 - z_9) \mathbf{a}_1 + \\ (x_9 - y_9 + z_9) \mathbf{a}_2 - \\ (x_9 + y_9 + z_9) \mathbf{a}_3 \end{pmatrix} = -ay_9 \hat{\mathbf{x}} - az_9 \hat{\mathbf{y}} + ax_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{181} &= \begin{pmatrix} (x_9 - y_9 - z_9) \mathbf{a}_1 - \\ (x_9 - y_9 + z_9) \mathbf{a}_2 + \\ (x_9 + y_9 + z_9) \mathbf{a}_3 \end{pmatrix} = ay_9 \hat{\mathbf{x}} + ax_9 \hat{\mathbf{y}} - az_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{182} &= \begin{pmatrix} -(x_9 - y_9 + z_9) \mathbf{a}_1 + \\ (x_9 - y_9 - z_9) \mathbf{a}_2 - \\ (x_9 + y_9 - z_9) \mathbf{a}_3 \end{pmatrix} = -ay_9 \hat{\mathbf{x}} - ax_9 \hat{\mathbf{y}} - az_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{183} &= \begin{pmatrix} -(x_9 + y_9 - z_9) \mathbf{a}_1 + \\ (x_9 + y_9 + z_9) \mathbf{a}_2 - \\ (x_9 - y_9 + z_9) \mathbf{a}_3 \end{pmatrix} = ay_9 \hat{\mathbf{x}} - ax_9 \hat{\mathbf{y}} + az_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{184} &= \begin{pmatrix} (x_9 + y_9 + z_9) \mathbf{a}_1 - \\ (x_9 + y_9 - z_9) \mathbf{a}_2 + \\ (x_9 - y_9 - z_9) \mathbf{a}_3 \end{pmatrix} = -ay_9 \hat{\mathbf{x}} + ax_9 \hat{\mathbf{y}} + az_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{185} &= \begin{pmatrix} -(x_9 + y_9 - z_9) \mathbf{a}_1 + \\ (x_9 - y_9 - z_9) \mathbf{a}_2 + \\ (x_9 + y_9 + z_9) \mathbf{a}_3 \end{pmatrix} = ax_9 \hat{\mathbf{x}} + az_9 \hat{\mathbf{y}} - ay_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{186} &= \begin{pmatrix} (x_9 + y_9 + z_9) \mathbf{a}_1 - \\ (x_9 - y_9 + z_9) \mathbf{a}_2 - \\ (x_9 + y_9 - z_9) \mathbf{a}_3 \end{pmatrix} = -ax_9 \hat{\mathbf{x}} + az_9 \hat{\mathbf{y}} + ay_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{187} &= \begin{pmatrix} (x_9 - y_9 - z_9) \mathbf{a}_1 - \\ (x_9 + y_9 - z_9) \mathbf{a}_2 - \\ (x_9 - y_9 + z_9) \mathbf{a}_3 \end{pmatrix} = -ax_9 \hat{\mathbf{x}} - az_9 \hat{\mathbf{y}} - ay_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{188} &= \begin{pmatrix} -(x_9 - y_9 + z_9) \mathbf{a}_1 + \\ (x_9 + y_9 + z_9) \mathbf{a}_2 + \\ (x_9 - y_9 - z_9) \mathbf{a}_3 \end{pmatrix} = ax_9 \hat{\mathbf{x}} - az_9 \hat{\mathbf{y}} + ay_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{189} &= \begin{pmatrix} -(x_9 - y_9 + z_9) \mathbf{a}_1 - \\ (x_9 + y_9 - z_9) \mathbf{a}_2 + \\ (x_9 + y_9 + z_9) \mathbf{a}_3 \end{pmatrix} = az_9 \hat{\mathbf{x}} + ay_9 \hat{\mathbf{y}} - ax_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{190} &= \begin{pmatrix} (x_9 - y_9 - z_9) \mathbf{a}_1 + \\ (x_9 + y_9 + z_9) \mathbf{a}_2 - \\ (x_9 + y_9 - z_9) \mathbf{a}_3 \end{pmatrix} = az_9 \hat{\mathbf{x}} - ay_9 \hat{\mathbf{y}} + ax_9 \hat{\mathbf{z}} & (96j) & \text{C VII} \\
\mathbf{B}_{191} &= \begin{pmatrix} (x_9 + y_9 + z_9) \mathbf{a}_1 + \\ (x_9 - y_9 - z_9) \mathbf{a}_2 - \\ (x_9 - y_9 + z_9) \mathbf{a}_3 \end{pmatrix} = -az_9 \hat{\mathbf{x}} + ay_9 \hat{\mathbf{y}} + ax_9 \hat{\mathbf{z}} & (96j) & \text{C VII}
\end{aligned}$$

$$\begin{aligned}
\mathbf{B}_{328} &= \begin{pmatrix} (x_{15} + y_{15} + z_{15}) \mathbf{a}_1 - \\ (x_{15} + y_{15} - z_{15}) \mathbf{a}_2 + \\ (x_{15} - y_{15} - z_{15}) \mathbf{a}_3 \end{pmatrix} = -ay_{15} \hat{\mathbf{x}} + ax_{15} \hat{\mathbf{y}} + az_{15} \hat{\mathbf{z}} & (96j) & \text{O III} \\
\mathbf{B}_{329} &= \begin{pmatrix} -(x_{15} + y_{15} - z_{15}) \mathbf{a}_1 + \\ (x_{15} - y_{15} - z_{15}) \mathbf{a}_2 + \\ (x_{15} + y_{15} + z_{15}) \mathbf{a}_3 \end{pmatrix} = ax_{15} \hat{\mathbf{x}} + az_{15} \hat{\mathbf{y}} - ay_{15} \hat{\mathbf{z}} & (96j) & \text{O III} \\
\mathbf{B}_{330} &= \begin{pmatrix} (x_{15} + y_{15} + z_{15}) \mathbf{a}_1 - \\ (x_{15} - y_{15} + z_{15}) \mathbf{a}_2 - \\ (x_{15} + y_{15} - z_{15}) \mathbf{a}_3 \end{pmatrix} = -ax_{15} \hat{\mathbf{x}} + az_{15} \hat{\mathbf{y}} + ay_{15} \hat{\mathbf{z}} & (96j) & \text{O III} \\
\mathbf{B}_{331} &= \begin{pmatrix} (x_{15} - y_{15} - z_{15}) \mathbf{a}_1 - \\ (x_{15} + y_{15} - z_{15}) \mathbf{a}_2 - \\ (x_{15} - y_{15} + z_{15}) \mathbf{a}_3 \end{pmatrix} = -ax_{15} \hat{\mathbf{x}} - az_{15} \hat{\mathbf{y}} - ay_{15} \hat{\mathbf{z}} & (96j) & \text{O III} \\
\mathbf{B}_{332} &= \begin{pmatrix} -(x_{15} - y_{15} + z_{15}) \mathbf{a}_1 + \\ (x_{15} + y_{15} + z_{15}) \mathbf{a}_2 + \\ (x_{15} - y_{15} - z_{15}) \mathbf{a}_3 \end{pmatrix} = ax_{15} \hat{\mathbf{x}} - az_{15} \hat{\mathbf{y}} + ay_{15} \hat{\mathbf{z}} & (96j) & \text{O III} \\
\mathbf{B}_{333} &= \begin{pmatrix} -(x_{15} - y_{15} + z_{15}) \mathbf{a}_1 - \\ (x_{15} + y_{15} - z_{15}) \mathbf{a}_2 + \\ (x_{15} + y_{15} + z_{15}) \mathbf{a}_3 \end{pmatrix} = az_{15} \hat{\mathbf{x}} + ay_{15} \hat{\mathbf{y}} - ax_{15} \hat{\mathbf{z}} & (96j) & \text{O III} \\
\mathbf{B}_{334} &= \begin{pmatrix} (x_{15} - y_{15} - z_{15}) \mathbf{a}_1 + \\ (x_{15} + y_{15} + z_{15}) \mathbf{a}_2 - \\ (x_{15} + y_{15} - z_{15}) \mathbf{a}_3 \end{pmatrix} = az_{15} \hat{\mathbf{x}} - ay_{15} \hat{\mathbf{y}} + ax_{15} \hat{\mathbf{z}} & (96j) & \text{O III} \\
\mathbf{B}_{335} &= \begin{pmatrix} (x_{15} + y_{15} + z_{15}) \mathbf{a}_1 + \\ (x_{15} - y_{15} - z_{15}) \mathbf{a}_2 - \\ (x_{15} - y_{15} + z_{15}) \mathbf{a}_3 \end{pmatrix} = -az_{15} \hat{\mathbf{x}} + ay_{15} \hat{\mathbf{y}} + ax_{15} \hat{\mathbf{z}} & (96j) & \text{O III} \\
\mathbf{B}_{336} &= \begin{pmatrix} -(x_{15} + y_{15} - z_{15}) \mathbf{a}_1 - \\ (x_{15} - y_{15} + z_{15}) \mathbf{a}_2 + \\ (x_{15} - y_{15} - z_{15}) \mathbf{a}_3 \end{pmatrix} = -az_{15} \hat{\mathbf{x}} - ay_{15} \hat{\mathbf{y}} - ax_{15} \hat{\mathbf{z}} & (96j) & \text{O III}
\end{aligned}$$

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