

fcc Fullerene (K_3C_{60}) Structure:

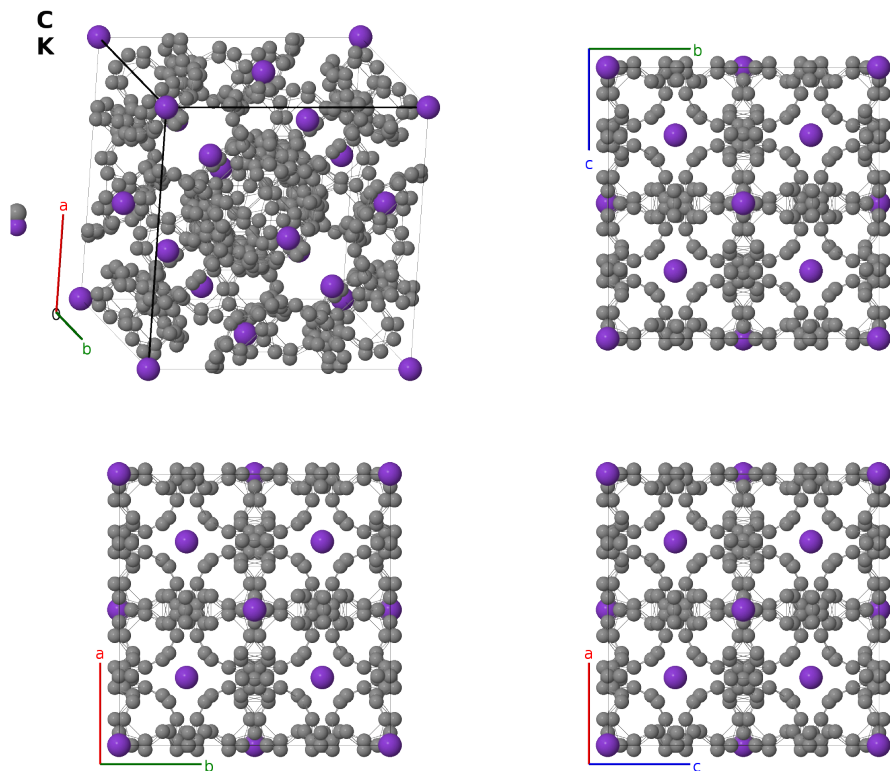
A40B_cF492_225_j2l_ac-001

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- D. Hicks, M. J. Mehl, M. Esters, C. Osos, O. Levy, G. L. W. Hart, C. Toher, and S. Curtarolo, *The AFLOW Library of Crystallographic Prototypes: Part 3*, Comput. Mater. Sci. **199**, 110450 (2021), doi: 10.1016/j.commatsci.2021.110450.

<https://aflow.org/prototype-encyclopedia/54ZJ>

https://aflow.org/prototype-encyclopedia/A40B_cF492_225_j2l_ac-001



Prototype	$C_{60}K_3$
AFLOW prototype label	A40B_cF492_225_j2l_ac-001
ICSD	66728
CCDC	1628791
Pearson symbol	cF492
Space group number	225
Space group symbol	$Fm\bar{3}m$
AFLOW prototype command	<code>aflow --proto=A40B_cF492_225_j2l_ac-001</code> <code>--params=a, y3, z3, x4, y4, z4, x5, y5, z5</code>

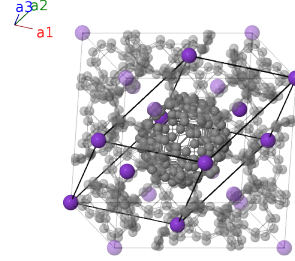
Other compounds with this structure

Cs₃C₆₀, CsK₂C₆₀, CsNa₂C₆₀, CsRb₂C₆₀, KNa₂C₆₀, Rb₃C₆₀, RbCs₂C₆₀, RbNa₂C₆₀

- All of the carbon sites are occupied only 50% of the time.
- (Stephens, 1991) put the K-I atom on the (4b) Wyckoff position, (1/2, 1/2, 1/2). We shifted this so that the atom is at the origin, the (4a) Wyckoff site.

Face-centered Cubic primitive vectors

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



Basis vectors

	Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B}_1$	= 0	=	0	(4a)	K I
$\mathbf{B}_2$	= $\frac{1}{4} \mathbf{a}_1 + \frac{1}{4} \mathbf{a}_2 + \frac{1}{4} \mathbf{a}_3$	=	$\frac{1}{4}a \hat{\mathbf{x}} + \frac{1}{4}a \hat{\mathbf{y}} + \frac{1}{4}a \hat{\mathbf{z}}$	(8c)	K II
$\mathbf{B}_3$	= $\frac{3}{4} \mathbf{a}_1 + \frac{3}{4} \mathbf{a}_2 + \frac{3}{4} \mathbf{a}_3$	=	$\frac{3}{4}a \hat{\mathbf{x}} + \frac{3}{4}a \hat{\mathbf{y}} + \frac{3}{4}a \hat{\mathbf{z}}$	(8c)	K II
$\mathbf{B}_4$	= $(y_3 + z_3) \mathbf{a}_1 - (y_3 - z_3) \mathbf{a}_2 + (y_3 - z_3) \mathbf{a}_3$	=	$ay_3 \hat{\mathbf{y}} + az_3 \hat{\mathbf{z}}$	(96j)	C I
$\mathbf{B}_5$	= $-(y_3 - z_3) \mathbf{a}_1 + (y_3 + z_3) \mathbf{a}_2 - (y_3 + z_3) \mathbf{a}_3$	=	$-ay_3 \hat{\mathbf{y}} + az_3 \hat{\mathbf{z}}$	(96j)	C I
$\mathbf{B}_6$	= $(y_3 - z_3) \mathbf{a}_1 - (y_3 + z_3) \mathbf{a}_2 + (y_3 + z_3) \mathbf{a}_3$	=	$ay_3 \hat{\mathbf{y}} - az_3 \hat{\mathbf{z}}$	(96j)	C I
$\mathbf{B}_7$	= $-(y_3 + z_3) \mathbf{a}_1 + (y_3 - z_3) \mathbf{a}_2 - (y_3 - z_3) \mathbf{a}_3$	=	$-ay_3 \hat{\mathbf{y}} - az_3 \hat{\mathbf{z}}$	(96j)	C I
$\mathbf{B}_8$	= $(y_3 - z_3) \mathbf{a}_1 + (y_3 + z_3) \mathbf{a}_2 - (y_3 - z_3) \mathbf{a}_3$	=	$az_3 \hat{\mathbf{x}} + ay_3 \hat{\mathbf{z}}$	(96j)	C I
$\mathbf{B}_9$	= $-(y_3 + z_3) \mathbf{a}_1 - (y_3 - z_3) \mathbf{a}_2 + (y_3 + z_3) \mathbf{a}_3$	=	$az_3 \hat{\mathbf{x}} - ay_3 \hat{\mathbf{z}}$	(96j)	C I
$\mathbf{B}_{10}$	= $(y_3 + z_3) \mathbf{a}_1 + (y_3 - z_3) \mathbf{a}_2 - (y_3 + z_3) \mathbf{a}_3$	=	$-az_3 \hat{\mathbf{x}} + ay_3 \hat{\mathbf{z}}$	(96j)	C I
$\mathbf{B}_{11}$	= $-(y_3 - z_3) \mathbf{a}_1 - (y_3 + z_3) \mathbf{a}_2 + (y_3 - z_3) \mathbf{a}_3$	=	$-az_3 \hat{\mathbf{x}} - ay_3 \hat{\mathbf{z}}$	(96j)	C I
$\mathbf{B}_{12}$	= $-(y_3 - z_3) \mathbf{a}_1 + (y_3 - z_3) \mathbf{a}_2 + (y_3 + z_3) \mathbf{a}_3$	=	$ay_3 \hat{\mathbf{x}} + az_3 \hat{\mathbf{y}}$	(96j)	C I
$\mathbf{B}_{13}$	= $(y_3 + z_3) \mathbf{a}_1 - (y_3 + z_3) \mathbf{a}_2 - (y_3 - z_3) \mathbf{a}_3$	=	$-ay_3 \hat{\mathbf{x}} + az_3 \hat{\mathbf{y}}$	(96j)	C I
$\mathbf{B}_{14}$	= $-(y_3 + z_3) \mathbf{a}_1 + (y_3 + z_3) \mathbf{a}_2 + (y_3 - z_3) \mathbf{a}_3$	=	$ay_3 \hat{\mathbf{x}} - az_3 \hat{\mathbf{y}}$	(96j)	C I

$$\begin{aligned}
\mathbf{B}_{15} &= \begin{pmatrix} (y_3 - z_3) \mathbf{a}_1 - (y_3 - z_3) \mathbf{a}_2 - \\ (y_3 + z_3) \mathbf{a}_3 \end{pmatrix} = -ay_3 \hat{\mathbf{x}} - az_3 \hat{\mathbf{y}} & (96j) & \text{C I} \\
\mathbf{B}_{16} &= \begin{pmatrix} -(y_3 + z_3) \mathbf{a}_1 + (y_3 - z_3) \mathbf{a}_2 + \\ (y_3 + z_3) \mathbf{a}_3 \end{pmatrix} = ay_3 \hat{\mathbf{x}} - az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
\mathbf{B}_{17} &= \begin{pmatrix} (y_3 - z_3) \mathbf{a}_1 - (y_3 + z_3) \mathbf{a}_2 - \\ (y_3 - z_3) \mathbf{a}_3 \end{pmatrix} = -ay_3 \hat{\mathbf{x}} - az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
\mathbf{B}_{18} &= \begin{pmatrix} -(y_3 - z_3) \mathbf{a}_1 + (y_3 + z_3) \mathbf{a}_2 + \\ (y_3 - z_3) \mathbf{a}_3 \end{pmatrix} = ay_3 \hat{\mathbf{x}} + az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
\mathbf{B}_{19} &= \begin{pmatrix} (y_3 + z_3) \mathbf{a}_1 - (y_3 - z_3) \mathbf{a}_2 - \\ (y_3 + z_3) \mathbf{a}_3 \end{pmatrix} = -ay_3 \hat{\mathbf{x}} + az_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
\mathbf{B}_{20} &= \begin{pmatrix} -(y_3 - z_3) \mathbf{a}_1 - (y_3 + z_3) \mathbf{a}_2 + \\ (y_3 + z_3) \mathbf{a}_3 \end{pmatrix} = az_3 \hat{\mathbf{y}} - ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
\mathbf{B}_{21} &= \begin{pmatrix} (y_3 + z_3) \mathbf{a}_1 + (y_3 - z_3) \mathbf{a}_2 - \\ (y_3 - z_3) \mathbf{a}_3 \end{pmatrix} = az_3 \hat{\mathbf{y}} + ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
\mathbf{B}_{22} &= \begin{pmatrix} -(y_3 + z_3) \mathbf{a}_1 - (y_3 - z_3) \mathbf{a}_2 + \\ (y_3 - z_3) \mathbf{a}_3 \end{pmatrix} = -az_3 \hat{\mathbf{y}} - ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
\mathbf{B}_{23} &= \begin{pmatrix} (y_3 - z_3) \mathbf{a}_1 + (y_3 + z_3) \mathbf{a}_2 - \\ (y_3 + z_3) \mathbf{a}_3 \end{pmatrix} = -az_3 \hat{\mathbf{y}} + ay_3 \hat{\mathbf{z}} & (96j) & \text{C I} \\
\mathbf{B}_{24} &= \begin{pmatrix} (y_3 - z_3) \mathbf{a}_1 - (y_3 - z_3) \mathbf{a}_2 + \\ (y_3 + z_3) \mathbf{a}_3 \end{pmatrix} = az_3 \hat{\mathbf{x}} + ay_3 \hat{\mathbf{y}} & (96j) & \text{C I} \\
\mathbf{B}_{25} &= \begin{pmatrix} -(y_3 + z_3) \mathbf{a}_1 + (y_3 + z_3) \mathbf{a}_2 - \\ (y_3 - z_3) \mathbf{a}_3 \end{pmatrix} = az_3 \hat{\mathbf{x}} - ay_3 \hat{\mathbf{y}} & (96j) & \text{C I} \\
\mathbf{B}_{26} &= \begin{pmatrix} (y_3 + z_3) \mathbf{a}_1 - (y_3 + z_3) \mathbf{a}_2 + \\ (y_3 - z_3) \mathbf{a}_3 \end{pmatrix} = -az_3 \hat{\mathbf{x}} + ay_3 \hat{\mathbf{y}} & (96j) & \text{C I} \\
\mathbf{B}_{27} &= \begin{pmatrix} -(y_3 - z_3) \mathbf{a}_1 + (y_3 - z_3) \mathbf{a}_2 - \\ (y_3 + z_3) \mathbf{a}_3 \end{pmatrix} = -az_3 \hat{\mathbf{x}} - ay_3 \hat{\mathbf{y}} & (96j) & \text{C I} \\
\mathbf{B}_{28} &= \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}} + ay_4 \hat{\mathbf{y}} + az_4 \hat{\mathbf{z}} & (192l) & \text{C II} \\
\mathbf{B}_{29} &= \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}} - ay_4 \hat{\mathbf{y}} + az_4 \hat{\mathbf{z}} & (192l) & \text{C II} \\
\mathbf{B}_{30} &= \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}} + ay_4 \hat{\mathbf{y}} - az_4 \hat{\mathbf{z}} & (192l) & \text{C II} \\
\mathbf{B}_{31} &= \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}} - ay_4 \hat{\mathbf{y}} - az_4 \hat{\mathbf{z}} & (192l) & \text{C II} \\
\mathbf{B}_{32} &= \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}} & (192l) & \text{C II} \\
\mathbf{B}_{33} &= \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}} & (192l) & \text{C II} \\
\mathbf{B}_{34} &= \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}} & (192l) & \text{C II}
\end{aligned}$$

$$\begin{aligned}
\mathbf{B}_{52} &= \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}} - ay_4 \hat{\mathbf{y}} - az_4 \hat{\mathbf{z}} & (192l) & \text{C II} \\
\mathbf{B}_{53} &= \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}} + ay_4 \hat{\mathbf{y}} - az_4 \hat{\mathbf{z}} & (192l) & \text{C II} \\
\mathbf{B}_{54} &= \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}} - ay_4 \hat{\mathbf{y}} + az_4 \hat{\mathbf{z}} & (192l) & \text{C II} \\
\mathbf{B}_{55} &= \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}} + ay_4 \hat{\mathbf{y}} + az_4 \hat{\mathbf{z}} & (192l) & \text{C II} \\
\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}} & (192l) & \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} = -az_4 \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} + ay_4 \hat{\mathbf{z}} & (192l) & \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} = az_4 \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} - ay_4 \hat{\mathbf{z}} & (192l) & \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} = az_4 \hat{\mathbf{x}} - ax_4 \hat{\mathbf{y}} + ay_4 \hat{\mathbf{z}} & (192l) & \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}} & (192l) & \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}} - az_4 \hat{\mathbf{y}} + ax_4 \hat{\mathbf{z}} & (192l) & \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}} + az_4 \hat{\mathbf{y}} + ax_4 \hat{\mathbf{z}} & (192l) & \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}} + az_4 \hat{\mathbf{y}} - ax_4 \hat{\mathbf{z}} & (192l) & \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}} & (192l) & \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} = ay_4 \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} + az_4 \hat{\mathbf{z}} & (192l) & \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} = -ay_4 \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} - az_4 \hat{\mathbf{z}} & (192l) & \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} = ay_4 \hat{\mathbf{x}} - ax_4 \hat{\mathbf{y}} - az_4 \hat{\mathbf{z}} & (192l) & \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}} & (192l) & \text{C II}
\end{aligned}$$

$\mathbf{B}_{69}$	$=$	$-(x_4 + y_4 + z_4) \mathbf{a}_1 +$ $(x_4 - y_4 + z_4) \mathbf{a}_2 +$ $(x_4 + y_4 - z_4) \mathbf{a}_3$	$=$	$ax_4 \hat{\mathbf{x}} - az_4 \hat{\mathbf{y}} - ay_4 \hat{\mathbf{z}}$	(192l)	C II
$\mathbf{B}_{70}$	$=$	$(-x_4 + y_4 + z_4) \mathbf{a}_1 +$ $(x_4 + y_4 - z_4) \mathbf{a}_2 +$ $(x_4 - y_4 + z_4) \mathbf{a}_3$	$=$	$ax_4 \hat{\mathbf{x}} + az_4 \hat{\mathbf{y}} + ay_4 \hat{\mathbf{z}}$	(192l)	C II
$\mathbf{B}_{71}$	$=$	$(x_4 - y_4 + z_4) \mathbf{a}_1 -$ $(x_4 + y_4 + z_4) \mathbf{a}_2 +$ $(-x_4 + y_4 + z_4) \mathbf{a}_3$	$=$	$-ax_4 \hat{\mathbf{x}} + az_4 \hat{\mathbf{y}} - ay_4 \hat{\mathbf{z}}$	(192l)	C II
$\mathbf{B}_{72}$	$=$	$(x_4 - y_4 + z_4) \mathbf{a}_1 +$ $(x_4 + y_4 - z_4) \mathbf{a}_2 -$ $(x_4 + y_4 + z_4) \mathbf{a}_3$	$=$	$-az_4 \hat{\mathbf{x}} - ay_4 \hat{\mathbf{y}} + ax_4 \hat{\mathbf{z}}$	(192l)	C II
$\mathbf{B}_{73}$	$=$	$(-x_4 + y_4 + z_4) \mathbf{a}_1 -$ $(x_4 + y_4 + z_4) \mathbf{a}_2 +$ $(x_4 + y_4 - z_4) \mathbf{a}_3$	$=$	$-az_4 \hat{\mathbf{x}} + ay_4 \hat{\mathbf{y}} - ax_4 \hat{\mathbf{z}}$	(192l)	C II
$\mathbf{B}_{74}$	$=$	$-(x_4 + y_4 + z_4) \mathbf{a}_1 +$ $(-x_4 + y_4 + z_4) \mathbf{a}_2 +$ $(x_4 - y_4 + z_4) \mathbf{a}_3$	$=$	$az_4 \hat{\mathbf{x}} - ay_4 \hat{\mathbf{y}} - ax_4 \hat{\mathbf{z}}$	(192l)	C II
$\mathbf{B}_{75}$	$=$	$(x_4 + y_4 - z_4) \mathbf{a}_1 +$ $(x_4 - y_4 + z_4) \mathbf{a}_2 +$ $(-x_4 + y_4 + z_4) \mathbf{a}_3$	$=$	$az_4 \hat{\mathbf{x}} + ay_4 \hat{\mathbf{y}} + ax_4 \hat{\mathbf{z}}$	(192l)	C II
$\mathbf{B}_{76}$	$=$	$(-x_5 + y_5 + z_5) \mathbf{a}_1 +$ $(x_5 - y_5 + z_5) \mathbf{a}_2 +$ $(x_5 + y_5 - z_5) \mathbf{a}_3$	$=$	$ax_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} + az_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{77}$	$=$	$(x_5 - y_5 + z_5) \mathbf{a}_1 +$ $(-x_5 + y_5 + z_5) \mathbf{a}_2 -$ $(x_5 + y_5 + z_5) \mathbf{a}_3$	$=$	$-ax_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} + az_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{78}$	$=$	$(x_5 + y_5 - z_5) \mathbf{a}_1 -$ $(x_5 + y_5 + z_5) \mathbf{a}_2 +$ $(-x_5 + y_5 + z_5) \mathbf{a}_3$	$=$	$-ax_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} - az_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{79}$	$=$	$-(x_5 + y_5 + z_5) \mathbf{a}_1 +$ $(x_5 + y_5 - z_5) \mathbf{a}_2 +$ $(x_5 - y_5 + z_5) \mathbf{a}_3$	$=$	$ax_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} - az_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{80}$	$=$	$(x_5 + y_5 - z_5) \mathbf{a}_1 +$ $(-x_5 + y_5 + z_5) \mathbf{a}_2 +$ $(x_5 - y_5 + z_5) \mathbf{a}_3$	$=$	$az_5 \hat{\mathbf{x}} + ax_5 \hat{\mathbf{y}} + ay_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{81}$	$=$	$-(x_5 + y_5 + z_5) \mathbf{a}_1 +$ $(x_5 - y_5 + z_5) \mathbf{a}_2 +$ $(-x_5 + y_5 + z_5) \mathbf{a}_3$	$=$	$az_5 \hat{\mathbf{x}} - ax_5 \hat{\mathbf{y}} - ay_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{82}$	$=$	$(-x_5 + y_5 + z_5) \mathbf{a}_1 +$ $(x_5 + y_5 - z_5) \mathbf{a}_2 -$ $(x_5 + y_5 + z_5) \mathbf{a}_3$	$=$	$-az_5 \hat{\mathbf{x}} - ax_5 \hat{\mathbf{y}} + ay_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{83}$	$=$	$(x_5 - y_5 + z_5) \mathbf{a}_1 -$ $(x_5 + y_5 + z_5) \mathbf{a}_2 +$ $(x_5 + y_5 - z_5) \mathbf{a}_3$	$=$	$-az_5 \hat{\mathbf{x}} + ax_5 \hat{\mathbf{y}} - ay_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{84}$	$=$	$(x_5 - y_5 + z_5) \mathbf{a}_1 +$ $(x_5 + y_5 - z_5) \mathbf{a}_2 +$ $(-x_5 + y_5 + z_5) \mathbf{a}_3$	$=$	$ay_5 \hat{\mathbf{x}} + az_5 \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{85}$	$=$	$(-x_5 + y_5 + z_5) \mathbf{a}_1 -$ $(x_5 + y_5 + z_5) \mathbf{a}_2 +$ $(x_5 - y_5 + z_5) \mathbf{a}_3$	$=$	$-ay_5 \hat{\mathbf{x}} + az_5 \hat{\mathbf{y}} - ax_5 \hat{\mathbf{z}}$	(192l)	C III

$\mathbf{B}_{86}$	$=$	$- (x_5 + y_5 + z_5) \mathbf{a}_1 + (-x_5 + y_5 + z_5) \mathbf{a}_2 + (x_5 + y_5 - z_5) \mathbf{a}_3$	$=$	$-ay_5 \hat{\mathbf{x}} - az_5 \hat{\mathbf{y}} - ax_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{87}$	$=$	$(x_5 + y_5 - z_5) \mathbf{a}_1 + (x_5 - y_5 + z_5) \mathbf{a}_2 - (x_5 + y_5 + z_5) \mathbf{a}_3$	$=$	$-ay_5 \hat{\mathbf{x}} - az_5 \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{88}$	$=$	$(x_5 - y_5 - z_5) \mathbf{a}_1 - (x_5 - y_5 + z_5) \mathbf{a}_2 + (x_5 + y_5 + z_5) \mathbf{a}_3$	$=$	$ay_5 \hat{\mathbf{x}} + ax_5 \hat{\mathbf{y}} - az_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{89}$	$=$	$-(x_5 - y_5 + z_5) \mathbf{a}_1 + (x_5 - y_5 - z_5) \mathbf{a}_2 - (x_5 + y_5 - z_5) \mathbf{a}_3$	$=$	$-ay_5 \hat{\mathbf{x}} - ax_5 \hat{\mathbf{y}} - az_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{90}$	$=$	$-(x_5 + y_5 - z_5) \mathbf{a}_1 + (x_5 + y_5 + z_5) \mathbf{a}_2 - (x_5 - y_5 + z_5) \mathbf{a}_3$	$=$	$ay_5 \hat{\mathbf{x}} - ax_5 \hat{\mathbf{y}} + az_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{91}$	$=$	$(x_5 + y_5 + z_5) \mathbf{a}_1 - (x_5 + y_5 - z_5) \mathbf{a}_2 + (x_5 - y_5 - z_5) \mathbf{a}_3$	$=$	$-ay_5 \hat{\mathbf{x}} + ax_5 \hat{\mathbf{y}} + az_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{92}$	$=$	$-(x_5 + y_5 - z_5) \mathbf{a}_1 + (x_5 - y_5 - z_5) \mathbf{a}_2 + (x_5 + y_5 + z_5) \mathbf{a}_3$	$=$	$ax_5 \hat{\mathbf{x}} + az_5 \hat{\mathbf{y}} - ay_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{93}$	$=$	$(x_5 + y_5 + z_5) \mathbf{a}_1 - (x_5 - y_5 + z_5) \mathbf{a}_2 - (x_5 + y_5 - z_5) \mathbf{a}_3$	$=$	$-ax_5 \hat{\mathbf{x}} + az_5 \hat{\mathbf{y}} + ay_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{94}$	$=$	$(x_5 - y_5 - z_5) \mathbf{a}_1 - (x_5 + y_5 - z_5) \mathbf{a}_2 - (x_5 - y_5 + z_5) \mathbf{a}_3$	$=$	$-ax_5 \hat{\mathbf{x}} - az_5 \hat{\mathbf{y}} - ay_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{95}$	$=$	$-(x_5 - y_5 + z_5) \mathbf{a}_1 + (x_5 + y_5 + z_5) \mathbf{a}_2 + (x_5 - y_5 - z_5) \mathbf{a}_3$	$=$	$ax_5 \hat{\mathbf{x}} - az_5 \hat{\mathbf{y}} + ay_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{96}$	$=$	$-(x_5 - y_5 + z_5) \mathbf{a}_1 - (x_5 + y_5 - z_5) \mathbf{a}_2 + (x_5 + y_5 + z_5) \mathbf{a}_3$	$=$	$az_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} - ax_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{97}$	$=$	$(x_5 - y_5 - z_5) \mathbf{a}_1 + (x_5 + y_5 + z_5) \mathbf{a}_2 - (x_5 + y_5 - z_5) \mathbf{a}_3$	$=$	$az_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{98}$	$=$	$(x_5 + y_5 + z_5) \mathbf{a}_1 + (x_5 - y_5 - z_5) \mathbf{a}_2 - (x_5 - y_5 + z_5) \mathbf{a}_3$	$=$	$-az_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{99}$	$=$	$-(x_5 + y_5 - z_5) \mathbf{a}_1 - (x_5 - y_5 + z_5) \mathbf{a}_2 + (x_5 - y_5 - z_5) \mathbf{a}_3$	$=$	$-az_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} - ax_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{100}$	$=$	$(x_5 - y_5 - z_5) \mathbf{a}_1 - (x_5 - y_5 + z_5) \mathbf{a}_2 - (x_5 + y_5 - z_5) \mathbf{a}_3$	$=$	$-ax_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} - az_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{101}$	$=$	$-(x_5 - y_5 + z_5) \mathbf{a}_1 + (x_5 - y_5 - z_5) \mathbf{a}_2 + (x_5 + y_5 + z_5) \mathbf{a}_3$	$=$	$ax_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} - az_5 \hat{\mathbf{z}}$	(192l)	C III
$\mathbf{B}_{102}$	$=$	$-(x_5 + y_5 - z_5) \mathbf{a}_1 + (x_5 + y_5 + z_5) \mathbf{a}_2 + (x_5 - y_5 - z_5) \mathbf{a}_3$	$=$	$ax_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} + az_5 \hat{\mathbf{z}}$	(192l)	C III

$$\begin{aligned}
\mathbf{B}_{103} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{104} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{105} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{106} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{107} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{108} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{109} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{110} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{111} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{112} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{113} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{114} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{115} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{116} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{117} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{118} &= \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}} & (192l) & \text{C III} \\
\mathbf{B}_{119} &= \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}} & (192l) & \text{C III}
\end{aligned}$$

$$\begin{aligned}
\mathbf{B}_{120} &= \begin{pmatrix} x_5 - y_5 + z_5 \\ x_5 + y_5 - z_5 \\ x_5 + y_5 + z_5 \end{pmatrix} \mathbf{a}_1 + \begin{pmatrix} x_5 - y_5 + z_5 \\ x_5 + y_5 - z_5 \\ x_5 + y_5 + z_5 \end{pmatrix} \mathbf{a}_2 - \begin{pmatrix} x_5 - y_5 + z_5 \\ x_5 + y_5 - z_5 \\ x_5 + y_5 + z_5 \end{pmatrix} \mathbf{a}_3 &= -az_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}} & (192l) & \text{C III} \\
\mathbf{B}_{121} &= \begin{pmatrix} -x_5 + y_5 + z_5 \\ x_5 + y_5 + z_5 \\ x_5 + y_5 - z_5 \end{pmatrix} \mathbf{a}_1 - \begin{pmatrix} -x_5 + y_5 + z_5 \\ x_5 + y_5 + z_5 \\ x_5 + y_5 - z_5 \end{pmatrix} \mathbf{a}_2 + \begin{pmatrix} -x_5 + y_5 + z_5 \\ x_5 + y_5 + z_5 \\ x_5 + y_5 - z_5 \end{pmatrix} \mathbf{a}_3 &= -az_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} - ax_5 \hat{\mathbf{z}} & (192l) & \text{C III} \\
\mathbf{B}_{122} &= \begin{pmatrix} -(x_5 + y_5 + z_5) \\ -(x_5 + y_5 + z_5) \\ (x_5 - y_5 + z_5) \end{pmatrix} \mathbf{a}_1 + \begin{pmatrix} -(x_5 + y_5 + z_5) \\ -(x_5 + y_5 + z_5) \\ (x_5 - y_5 + z_5) \end{pmatrix} \mathbf{a}_2 + \begin{pmatrix} -(x_5 + y_5 + z_5) \\ -(x_5 + y_5 + z_5) \\ (x_5 - y_5 + z_5) \end{pmatrix} \mathbf{a}_3 &= az_5 \hat{\mathbf{x}} - ay_5 \hat{\mathbf{y}} - ax_5 \hat{\mathbf{z}} & (192l) & \text{C III} \\
\mathbf{B}_{123} &= \begin{pmatrix} (x_5 + y_5 - z_5) \\ (x_5 - y_5 + z_5) \\ -(x_5 + y_5 + z_5) \end{pmatrix} \mathbf{a}_1 + \begin{pmatrix} (x_5 + y_5 - z_5) \\ (x_5 - y_5 + z_5) \\ -(x_5 + y_5 + z_5) \end{pmatrix} \mathbf{a}_2 + \begin{pmatrix} (x_5 + y_5 - z_5) \\ (x_5 - y_5 + z_5) \\ -(x_5 + y_5 + z_5) \end{pmatrix} \mathbf{a}_3 &= az_5 \hat{\mathbf{x}} + ay_5 \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}} & (192l) & \text{C III}
\end{aligned}$$

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