Zr_3PD_3 Structure: A4BC3_tP64_133_2k_h_i2j-001

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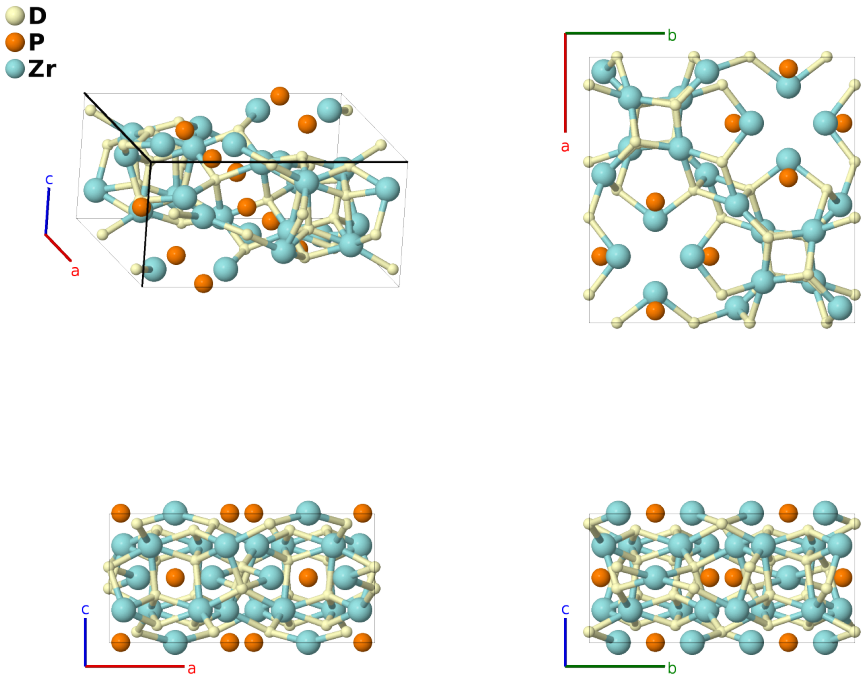
https://aflow.org/p/XBGP

https://aflow.org/p/A4BC3_tP64_133_2k_h_i2j-001



Prototype	H_3PZr_3
AFLOW prototype label	A4BC3_tP64_133_2k_h_i2j-001
ICSD	68531
Pearson symbol	tP64
Space group number	133
Space group symbol	$P4_2/nbc$
AFLOW prototype command	`aflow --proto=A4BC3_tP64_133_2k_h_i2j-001 --params=`$a, c/a, x_1, x_2, x_3, x_4, x_5, y_5, z_5, x_6, y_6, z_6$

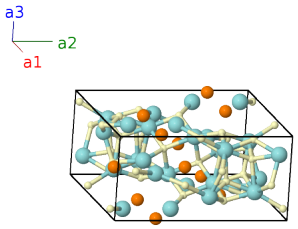
Other compounds with this structure
Ti_3PD_3

- The D-I (16k) site has a small number of vacancies (0.4%).
- The D-II (16k) site is 44.7% occupied.

- Removing all of the deuterium atoms makes this isostructural with β-V_3S.

Simple Tetragonal primitive vectors

$$\mathbf{a_1} = a\,\hat{\mathbf{x}}$$
$$\mathbf{a_2} = a\,\hat{\mathbf{y}}$$
$$\mathbf{a_3} = c\,\hat{\mathbf{z}}$$



Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_1}$	=	$x_1\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2$	=	$ax_1\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}}$	(8h)	P I
$\mathbf{B_2}$	=	$-\left(x_1 - \frac{1}{2}\right)\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2$	=	$-a\left(x_1 - \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}}$	(8h)	P I
$\mathbf{B_3}$	=	$\frac{1}{4}\,\mathbf{a}_1 + x_1\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + ax_1\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(8h)	P I
$\mathbf{B_4}$	=	$\frac{1}{4}\,\mathbf{a}_1 - \left(x_1 - \frac{1}{2}\right)\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} - a\left(x_1 - \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(8h)	P I
$\mathbf{B_5}$	=	$-x_1\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_2$	=	$-ax_1\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}}$	(8h)	P I
$\mathbf{B_6}$	=	$\left(x_1 + \frac{1}{2}\right)\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_2$	=	$a\left(x_1 + \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}}$	(8h)	P I
$\mathbf{B_7}$	=	$\frac{3}{4}\,\mathbf{a}_1 - x_1\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} - ax_1\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(8h)	P I
$\mathbf{B_8}$	=	$\frac{3}{4}\,\mathbf{a}_1 + \left(x_1 + \frac{1}{2}\right)\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} + a\left(x_1 + \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(8h)	P I
$\mathbf{B_9}$	=	$x_2\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$ax_2\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(8i)	Zr I
$\mathbf{B_{10}}$	=	$-\left(x_2 - \frac{1}{2}\right)\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$-a\left(x_2 - \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(8i)	Zr I
$\mathbf{B_{11}}$	=	$\frac{1}{4}\,\mathbf{a}_1 + x_2\,\mathbf{a}_2$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + ax_2\,\hat{\mathbf{y}}$	(8i)	Zr I
$\mathbf{B_{12}}$	=	$\frac{1}{4}\,\mathbf{a}_1 - \left(x_2 - \frac{1}{2}\right)\,\mathbf{a}_2$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} - a\left(x_2 - \frac{1}{2}\right)\,\hat{\mathbf{y}}$	(8i)	Zr I
$\mathbf{B_{13}}$	=	$-x_2\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$-ax_2\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(8i)	Zr I
$\mathbf{B_{14}}$	=	$\left(x_2 + \frac{1}{2}\right)\,\mathbf{a}_1 + \frac{3}{4}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$a\left(x_2 + \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{3}{4}a\,\hat{\mathbf{y}} + \frac{1}{2}c\,\hat{\mathbf{z}}$	(8i)	Zr I
$\mathbf{B_{15}}$	=	$\frac{3}{4}\,\mathbf{a}_1 - x_2\,\mathbf{a}_2$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} - ax_2\,\hat{\mathbf{y}}$	(8i)	Zr I
$\mathbf{B_{16}}$	=	$\frac{3}{4}\,\mathbf{a}_1 + \left(x_2 + \frac{1}{2}\right)\,\mathbf{a}_2$	=	$\frac{3}{4}a\,\hat{\mathbf{x}} + a\left(x_2 + \frac{1}{2}\right)\,\hat{\mathbf{y}}$	(8i)	Zr I
$\mathbf{B_{17}}$	=	$x_3\,\mathbf{a}_1 + x_3\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$ax_3\,\hat{\mathbf{x}} + ax_3\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(8j)	Zr II
$\mathbf{B_{18}}$	=	$-\left(x_3 - \frac{1}{2}\right)\,\mathbf{a}_1 - \left(x_3 - \frac{1}{2}\right)\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$-a\left(x_3 - \frac{1}{2}\right)\,\hat{\mathbf{x}} - a\left(x_3 - \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(8j)	Zr II
$\mathbf{B_{19}}$	=	$-\left(x_3 - \frac{1}{2}\right)\,\mathbf{a}_1 + x_3\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$-a\left(x_3 - \frac{1}{2}\right)\,\hat{\mathbf{x}} + ax_3\,\hat{\mathbf{y}} + \frac{3}{4}c\,\hat{\mathbf{z}}$	(8j)	Zr II
$\mathbf{B_{20}}$	=	$x_3\,\mathbf{a}_1 - \left(x_3 - \frac{1}{2}\right)\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$ax_3\,\hat{\mathbf{x}} - a\left(x_3 - \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{3}{4}c\,\hat{\mathbf{z}}$	(8j)	Zr II
$\mathbf{B_{21}}$	=	$-x_3\,\mathbf{a}_1 - x_3\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$-ax_3\,\hat{\mathbf{x}} - ax_3\,\hat{\mathbf{y}} + \frac{3}{4}c\,\hat{\mathbf{z}}$	(8j)	Zr II
$\mathbf{B_{22}}$	=	$\left(x_3 + \frac{1}{2}\right)\,\mathbf{a}_1 + \left(x_3 + \frac{1}{2}\right)\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$a\left(x_3 + \frac{1}{2}\right)\,\hat{\mathbf{x}} + a\left(x_3 + \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{3}{4}c\,\hat{\mathbf{z}}$	(8j)	Zr II
$\mathbf{B_{23}}$	=	$\left(x_3 + \frac{1}{2}\right)\,\mathbf{a}_1 - x_3\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$a\left(x_3 + \frac{1}{2}\right)\,\hat{\mathbf{x}} - ax_3\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(8j)	Zr II
$\mathbf{B_{24}}$	=	$-x_3\,\mathbf{a}_1 + \left(x_3 + \frac{1}{2}\right)\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$-ax_3\,\hat{\mathbf{x}} + a\left(x_3 + \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(8j)	Zr II
$\mathbf{B_{25}}$	=	$x_4\,\mathbf{a}_1 + x_4\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$ax_4\,\hat{\mathbf{x}} + ax_4\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(8j)	Zr III
$\mathbf{B_{26}}$	=	$-\left(x_4 - \frac{1}{2}\right)\,\mathbf{a}_1 - \left(x_4 - \frac{1}{2}\right)\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$-a\left(x_4 - \frac{1}{2}\right)\,\hat{\mathbf{x}} - a\left(x_4 - \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(8j)	Zr III

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\begin{array}{lcccccll}
\mathbf{B_{27}} & = & -\left(x_4-\frac{1}{2}\right)\mathbf{a}_1+x_4\,\mathbf{a}_2+\frac{3}{4}\,\mathbf{a}_3 & = & -a\left(x_4-\frac{1}{2}\right)\hat{\mathbf{x}}+ax_4\,\hat{\mathbf{y}}+\frac{3}{4}c\,\hat{\mathbf{z}} & (8\mathrm{j}) & \text{Zr III}\\
\mathbf{B_{28}} & = & x_4\,\mathbf{a}_1-\left(x_4-\frac{1}{2}\right)\mathbf{a}_2+\frac{3}{4}\,\mathbf{a}_3 & = & ax_4\,\hat{\mathbf{x}}-a\left(x_4-\frac{1}{2}\right)\hat{\mathbf{y}}+\frac{3}{4}c\,\hat{\mathbf{z}} & (8\mathrm{j}) & \text{Zr III}\\
\mathbf{B_{29}} & = & -x_4\,\mathbf{a}_1-x_4\,\mathbf{a}_2+\frac{3}{4}\,\mathbf{a}_3 & = & -ax_4\,\hat{\mathbf{x}}-ax_4\,\hat{\mathbf{y}}+\frac{3}{4}c\,\hat{\mathbf{z}} & (8\mathrm{j}) & \text{Zr III}\\
\mathbf{B_{30}} & = & \left(x_4+\frac{1}{2}\right)\mathbf{a}_1+\left(x_4+\frac{1}{2}\right)\mathbf{a}_2+\frac{3}{4}\,\mathbf{a}_3 & = & a\left(x_4+\frac{1}{2}\right)\hat{\mathbf{x}}+a\left(x_4+\frac{1}{2}\right)\hat{\mathbf{y}}+\frac{3}{4}c\,\hat{\mathbf{z}} & (8\mathrm{j}) & \text{Zr III}\\
\mathbf{B_{31}} & = & \left(x_4+\frac{1}{2}\right)\mathbf{a}_1-x_4\,\mathbf{a}_2+\frac{1}{4}\,\mathbf{a}_3 & = & a\left(x_4+\frac{1}{2}\right)\hat{\mathbf{x}}-ax_4\,\hat{\mathbf{y}}+\frac{1}{4}c\,\hat{\mathbf{z}} & (8\mathrm{j}) & \text{Zr III}\\
\mathbf{B_{32}} & = & -x_4\,\mathbf{a}_1+\left(x_4+\frac{1}{2}\right)\mathbf{a}_2+\frac{1}{4}\,\mathbf{a}_3 & = & -ax_4\,\hat{\mathbf{x}}+a\left(x_4+\frac{1}{2}\right)\hat{\mathbf{y}}+\frac{1}{4}c\,\hat{\mathbf{z}} & (8\mathrm{j}) & \text{Zr III}\\
\mathbf{B_{33}} & = & x_5\,\mathbf{a}_1+y_5\,\mathbf{a}_2+z_5\,\mathbf{a}_3 & = & ax_5\,\hat{\mathbf{x}}+ay_5\,\hat{\mathbf{y}}+cz_5\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{34}} & = & -\left(x_5-\frac{1}{2}\right)\mathbf{a}_1-\left(y_5-\frac{1}{2}\right)\mathbf{a}_2+z_5\,\mathbf{a}_3 & = & -a\left(x_5-\frac{1}{2}\right)\hat{\mathbf{x}}-a\left(y_5-\frac{1}{2}\right)\hat{\mathbf{y}}+cz_5\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{35}} & = & -\left(y_5-\frac{1}{2}\right)\mathbf{a}_1+x_5\,\mathbf{a}_2+\left(z_5+\frac{1}{2}\right)\mathbf{a}_3 & = & -a\left(y_5-\frac{1}{2}\right)\hat{\mathbf{x}}+ax_5\,\hat{\mathbf{y}}+c\left(z_5+\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{36}} & = & y_5\,\mathbf{a}_1-\left(x_5-\frac{1}{2}\right)\mathbf{a}_2+\left(z_5+\frac{1}{2}\right)\mathbf{a}_3 & = & ay_5\,\hat{\mathbf{x}}-a\left(x_5-\frac{1}{2}\right)\hat{\mathbf{y}}+c\left(z_5+\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{37}} & = & -\left(x_5-\frac{1}{2}\right)\mathbf{a}_1+y_5\,\mathbf{a}_2-z_5\,\mathbf{a}_3 & = & -a\left(x_5-\frac{1}{2}\right)\hat{\mathbf{x}}+ay_5\,\hat{\mathbf{y}}-cz_5\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{38}} & = & x_5\,\mathbf{a}_1-\left(y_5-\frac{1}{2}\right)\mathbf{a}_2-z_5\,\mathbf{a}_3 & = & ax_5\,\hat{\mathbf{x}}-a\left(y_5-\frac{1}{2}\right)\hat{\mathbf{y}}-cz_5\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{39}} & = & y_5\,\mathbf{a}_1+x_5\,\mathbf{a}_2-\left(z_5-\frac{1}{2}\right)\mathbf{a}_3 & = & ay_5\,\hat{\mathbf{x}}+ax_5\,\hat{\mathbf{y}}-c\left(z_5-\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{40}} & = & -\left(y_5-\frac{1}{2}\right)\mathbf{a}_1-\left(x_5-\frac{1}{2}\right)\mathbf{a}_2-\left(z_5-\frac{1}{2}\right)\mathbf{a}_3 & = & -a\left(y_5-\frac{1}{2}\right)\hat{\mathbf{x}}-a\left(x_5-\frac{1}{2}\right)\hat{\mathbf{y}}-c\left(z_5-\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{41}} & = & -x_5\,\mathbf{a}_1-y_5\,\mathbf{a}_2-z_5\,\mathbf{a}_3 & = & -ax_5\,\hat{\mathbf{x}}-ay_5\,\hat{\mathbf{y}}-cz_5\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{42}} & = & \left(x_5+\frac{1}{2}\right)\mathbf{a}_1+\left(y_5+\frac{1}{2}\right)\mathbf{a}_2-z_5\,\mathbf{a}_3 & = & a\left(x_5+\frac{1}{2}\right)\hat{\mathbf{x}}+a\left(y_5+\frac{1}{2}\right)\hat{\mathbf{y}}-cz_5\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{43}} & = & \left(y_5+\frac{1}{2}\right)\mathbf{a}_1-x_5\,\mathbf{a}_2-\left(z_5-\frac{1}{2}\right)\mathbf{a}_3 & = & a\left(y_5+\frac{1}{2}\right)\hat{\mathbf{x}}-ax_5\,\hat{\mathbf{y}}-c\left(z_5-\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{44}} & = & -y_5\,\mathbf{a}_1+\left(x_5+\frac{1}{2}\right)\mathbf{a}_2-\left(z_5-\frac{1}{2}\right)\mathbf{a}_3 & = & -ay_5\,\hat{\mathbf{x}}+a\left(x_5+\frac{1}{2}\right)\hat{\mathbf{y}}-c\left(z_5-\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{45}} & = & \left(x_5+\frac{1}{2}\right)\mathbf{a}_1-y_5\,\mathbf{a}_2+z_5\,\mathbf{a}_3 & = & a\left(x_5+\frac{1}{2}\right)\hat{\mathbf{x}}-ay_5\,\hat{\mathbf{y}}+cz_5\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{46}} & = & -x_5\,\mathbf{a}_1+\left(y_5+\frac{1}{2}\right)\mathbf{a}_2+z_5\,\mathbf{a}_3 & = & -ax_5\,\hat{\mathbf{x}}+a\left(y_5+\frac{1}{2}\right)\hat{\mathbf{y}}+cz_5\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{47}} & = & -y_5\,\mathbf{a}_1-x_5\,\mathbf{a}_2+\left(z_5+\frac{1}{2}\right)\mathbf{a}_3 & = & -ay_5\,\hat{\mathbf{x}}-ax_5\,\hat{\mathbf{y}}+c\left(z_5+\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{48}} & = & \left(y_5+\frac{1}{2}\right)\mathbf{a}_1+\left(x_5+\frac{1}{2}\right)\mathbf{a}_2+\left(z_5+\frac{1}{2}\right)\mathbf{a}_3 & = & a\left(y_5+\frac{1}{2}\right)\hat{\mathbf{x}}+a\left(x_5+\frac{1}{2}\right)\hat{\mathbf{y}}+c\left(z_5+\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D I}\\
\mathbf{B_{49}} & = & x_6\,\mathbf{a}_1+y_6\,\mathbf{a}_2+z_6\,\mathbf{a}_3 & = & ax_6\,\hat{\mathbf{x}}+ay_6\,\hat{\mathbf{y}}+cz_6\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{50}} & = & -\left(x_6-\frac{1}{2}\right)\mathbf{a}_1-\left(y_6-\frac{1}{2}\right)\mathbf{a}_2+z_6\,\mathbf{a}_3 & = & -a\left(x_6-\frac{1}{2}\right)\hat{\mathbf{x}}-a\left(y_6-\frac{1}{2}\right)\hat{\mathbf{y}}+cz_6\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{51}} & = & -\left(y_6-\frac{1}{2}\right)\mathbf{a}_1+x_6\,\mathbf{a}_2+\left(z_6+\frac{1}{2}\right)\mathbf{a}_3 & = & -a\left(y_6-\frac{1}{2}\right)\hat{\mathbf{x}}+ax_6\,\hat{\mathbf{y}}+c\left(z_6+\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{52}} & = & y_6\,\mathbf{a}_1-\left(x_6-\frac{1}{2}\right)\mathbf{a}_2+\left(z_6+\frac{1}{2}\right)\mathbf{a}_3 & = & ay_6\,\hat{\mathbf{x}}-a\left(x_6-\frac{1}{2}\right)\hat{\mathbf{y}}+c\left(z_6+\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{53}} & = & -\left(x_6-\frac{1}{2}\right)\mathbf{a}_1+y_6\,\mathbf{a}_2-z_6\,\mathbf{a}_3 & = & -a\left(x_6-\frac{1}{2}\right)\hat{\mathbf{x}}+ay_6\,\hat{\mathbf{y}}-cz_6\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{54}} & = & x_6\,\mathbf{a}_1-\left(y_6-\frac{1}{2}\right)\mathbf{a}_2-z_6\,\mathbf{a}_3 & = & ax_6\,\hat{\mathbf{x}}-a\left(y_6-\frac{1}{2}\right)\hat{\mathbf{y}}-cz_6\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{55}} & = & y_6\,\mathbf{a}_1+x_6\,\mathbf{a}_2-\left(z_6-\frac{1}{2}\right)\mathbf{a}_3 & = & ay_6\,\hat{\mathbf{x}}+ax_6\,\hat{\mathbf{y}}-c\left(z_6-\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{56}} & = & -\left(y_6-\frac{1}{2}\right)\mathbf{a}_1-\left(x_6-\frac{1}{2}\right)\mathbf{a}_2-\left(z_6-\frac{1}{2}\right)\mathbf{a}_3 & = & -a\left(y_6-\frac{1}{2}\right)\hat{\mathbf{x}}-a\left(x_6-\frac{1}{2}\right)\hat{\mathbf{y}}-c\left(z_6-\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{57}} & = & -x_6\,\mathbf{a}_1-y_6\,\mathbf{a}_2-z_6\,\mathbf{a}_3 & = & -ax_6\,\hat{\mathbf{x}}-ay_6\,\hat{\mathbf{y}}-cz_6\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{58}} & = & \left(x_6+\frac{1}{2}\right)\mathbf{a}_1+\left(y_6+\frac{1}{2}\right)\mathbf{a}_2-z_6\,\mathbf{a}_3 & = & a\left(x_6+\frac{1}{2}\right)\hat{\mathbf{x}}+a\left(y_6+\frac{1}{2}\right)\hat{\mathbf{y}}-cz_6\,\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{59}} & = & \left(y_6+\frac{1}{2}\right)\mathbf{a}_1-x_6\,\mathbf{a}_2-\left(z_6-\frac{1}{2}\right)\mathbf{a}_3 & = & a\left(y_6+\frac{1}{2}\right)\hat{\mathbf{x}}-ax_6\,\hat{\mathbf{y}}-c\left(z_6-\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}\\
\mathbf{B_{60}} & = & -y_6\,\mathbf{a}_1+\left(x_6+\frac{1}{2}\right)\mathbf{a}_2-\left(z_6-\frac{1}{2}\right)\mathbf{a}_3 & = & -ay_6\,\hat{\mathbf{x}}+a\left(x_6+\frac{1}{2}\right)\hat{\mathbf{y}}-c\left(z_6-\frac{1}{2}\right)\hat{\mathbf{z}} & (16\mathrm{k}) & \text{D II}
\end{array}
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$\mathbf{B_{61}}$	=	$\left(x_6+\frac{1}{2}\right)\,\mathbf{a}_1 - y_6\,\mathbf{a}_2 + z_6\,\mathbf{a}_3$	=	$a\left(x_6+\frac{1}{2}\right)\,\hat{\mathbf{x}} - a y_6\,\hat{\mathbf{y}} + c z_6\,\hat{\mathbf{z}}$	(16k)	D II
$\mathbf{B_{62}}$	=	$-x_6\,\mathbf{a}_1 + \left(y_6+\frac{1}{2}\right)\,\mathbf{a}_2 + z_6\,\mathbf{a}_3$	=	$-a x_6\,\hat{\mathbf{x}} + a\left(y_6+\frac{1}{2}\right)\,\hat{\mathbf{y}} + c z_6\,\hat{\mathbf{z}}$	(16k)	D II
$\mathbf{B_{63}}$	=	$-y_6\,\mathbf{a}_1 - x_6\,\mathbf{a}_2 + \left(z_6+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$-a y_6\,\hat{\mathbf{x}} - a x_6\,\hat{\mathbf{y}} + c\left(z_6+\frac{1}{2}\right)\,\hat{\mathbf{z}}$	(16k)	D II
$\mathbf{B_{64}}$	=	$\left(y_6+\frac{1}{2}\right)\,\mathbf{a}_1 + \left(x_6+\frac{1}{2}\right)\,\mathbf{a}_2 + \left(z_6+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$a\left(y_6+\frac{1}{2}\right)\,\hat{\mathbf{x}} + a\left(x_6+\frac{1}{2}\right)\,\hat{\mathbf{y}} + c\left(z_6+\frac{1}{2}\right)\,\hat{\mathbf{z}}$	(16k)	D II

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