Pyrochlore ($Na_3Co(CO_3)_2Cl$) Structure: A2BCD3E6_cF208_203_e_c_d_f_g-001

This structure originally had the label `A2BCD3E6_cF208_203_e_c_d_f_g`. Calls to that address will be redirected here.

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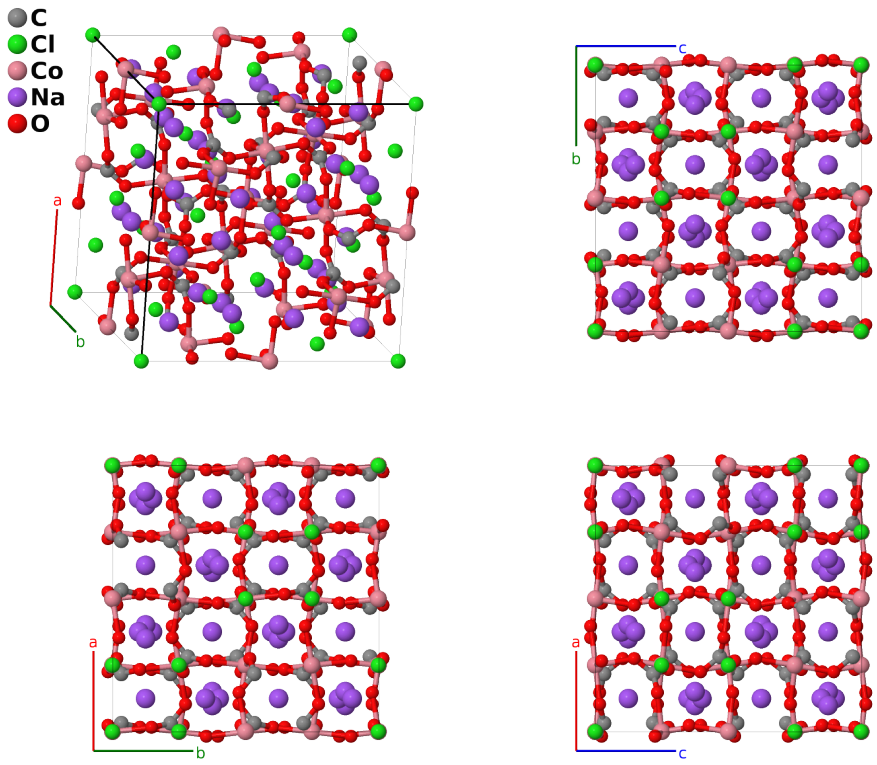
https://aflow.org/p/LH7J

https://aflow.org/p/A2BCD3E6_cF208_203_e_c_d_f_g-001



Prototype	$C_2ClCoNa_3O_6$
AFLOW prototype label	A2BCD3E6_cF208_203_e_c_d_f_g-001
Mineral name	pyrochlore
ICSD	none
Pearson symbol	cF208
Space group number	203
Space group symbol	$Fd\bar{3}$
AFLOW prototype command	`aflow --proto=A2BCD3E6_cF208_203_e_c_d_f_g-001 --params=`$a, x_3, x_4, x_5, y_5, z_5$

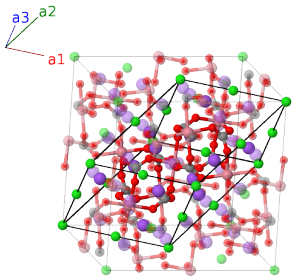
Other compounds with this structure

$Na_3MgCl(CO_3)_2$ (northupite), $Na_3MgBr(CO_3)_2$

- This structure was suggested to us by Prof. Joel Helton, United States Naval Academy. This is a pyrochlore-like antiferromagnet, which we loosely define as a structure with magnetic ions on the corners of corner-sharing tetrahedra.
- We use the structural data taken by (Fu, 2013) at 3.7K

Face-centered Cubic primitive vectors

$$\begin{aligned}
\mathbf{a_1} &= \tfrac{1}{2}a\,\hat{\mathbf{y}} + \tfrac{1}{2}a\,\hat{\mathbf{z}} \\
\mathbf{a_2} &= \tfrac{1}{2}a\,\hat{\mathbf{x}} + \tfrac{1}{2}a\,\hat{\mathbf{z}} \\
\mathbf{a_3} &= \tfrac{1}{2}a\,\hat{\mathbf{x}} + \tfrac{1}{2}a\,\hat{\mathbf{y}}
\end{aligned}$$



Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_1}$	=	0	=	0	(16c)	Cl I
$\mathbf{B_2}$	=	$\frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}}$	(16c)	Cl I
$\mathbf{B_3}$	=	$\frac{1}{2}\,\mathbf{a}_2$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(16c)	Cl I
$\mathbf{B_4}$	=	$\frac{1}{2}\,\mathbf{a}_1$	=	$\frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(16c)	Cl I
$\mathbf{B_5}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(16d)	Co I
$\mathbf{B_6}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(16d)	Co I
$\mathbf{B_7}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(16d)	Co I
$\mathbf{B_8}$	=	$\frac{1}{2}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(16d)	Co I
$\mathbf{B_9}$	=	$x_3\,\mathbf{a}_1 + x_3\,\mathbf{a}_2 + x_3\,\mathbf{a}_3$	=	$ax_3\,\hat{\mathbf{x}} + ax_3\,\hat{\mathbf{y}} + ax_3\,\hat{\mathbf{z}}$	(32e)	C I
$\mathbf{B_{10}}$	=	$x_3\,\mathbf{a}_1 + x_3\,\mathbf{a}_2 - \left(3x_3 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-a\left(x_3 - \frac{1}{4}\right)\,\hat{\mathbf{x}} - a\left(x_3 - \frac{1}{4}\right)\,\hat{\mathbf{y}} + ax_3\,\hat{\mathbf{z}}$	(32e)	C I
$\mathbf{B_{11}}$	=	$x_3\,\mathbf{a}_1 - \left(3x_3 - \frac{1}{2}\right)\,\mathbf{a}_2 + x_3\,\mathbf{a}_3$	=	$-a\left(x_3 - \frac{1}{4}\right)\,\hat{\mathbf{x}} + ax_3\,\hat{\mathbf{y}} - a\left(x_3 - \frac{1}{4}\right)\,\hat{\mathbf{z}}$	(32e)	C I
$\mathbf{B_{12}}$	=	$-\left(3x_3 - \frac{1}{2}\right)\,\mathbf{a}_1 + x_3\,\mathbf{a}_2 + x_3\,\mathbf{a}_3$	=	$ax_3\,\hat{\mathbf{x}} - a\left(x_3 - \frac{1}{4}\right)\,\hat{\mathbf{y}} - a\left(x_3 - \frac{1}{4}\right)\,\hat{\mathbf{z}}$	(32e)	C I
$\mathbf{B_{13}}$	=	$-x_3\,\mathbf{a}_1 - x_3\,\mathbf{a}_2 - x_3\,\mathbf{a}_3$	=	$-ax_3\,\hat{\mathbf{x}} - ax_3\,\hat{\mathbf{y}} - ax_3\,\hat{\mathbf{z}}$	(32e)	C I
$\mathbf{B_{14}}$	=	$-x_3\,\mathbf{a}_1 - x_3\,\mathbf{a}_2 + \left(3x_3 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$a\left(x_3 + \frac{1}{4}\right)\,\hat{\mathbf{x}} + a\left(x_3 + \frac{1}{4}\right)\,\hat{\mathbf{y}} - ax_3\,\hat{\mathbf{z}}$	(32e)	C I
$\mathbf{B_{15}}$	=	$-x_3\,\mathbf{a}_1 + \left(3x_3 + \frac{1}{2}\right)\,\mathbf{a}_2 - x_3\,\mathbf{a}_3$	=	$a\left(x_3 + \frac{1}{4}\right)\,\hat{\mathbf{x}} - ax_3\,\hat{\mathbf{y}} + a\left(x_3 + \frac{1}{4}\right)\,\hat{\mathbf{z}}$	(32e)	C I
$\mathbf{B_{16}}$	=	$\left(3x_3 + \frac{1}{2}\right)\,\mathbf{a}_1 - x_3\,\mathbf{a}_2 - x_3\,\mathbf{a}_3$	=	$-ax_3\,\hat{\mathbf{x}} + a\left(x_3 + \frac{1}{4}\right)\,\hat{\mathbf{y}} + a\left(x_3 + \frac{1}{4}\right)\,\hat{\mathbf{z}}$	(32e)	C I
$\mathbf{B_{17}}$	=	$-\left(x_4 - \frac{1}{4}\right)\,\mathbf{a}_1 + x_4\,\mathbf{a}_2 + x_4\,\mathbf{a}_3$	=	$ax_4\,\hat{\mathbf{x}} + \frac{1}{8}a\,\hat{\mathbf{y}} + \frac{1}{8}a\,\hat{\mathbf{z}}$	(48f)	Na I
$\mathbf{B_{18}}$	=	$x_4\,\mathbf{a}_1 - \left(x_4 - \frac{1}{4}\right)\,\mathbf{a}_2 - \left(x_4 - \frac{1}{4}\right)\,\mathbf{a}_3$	=	$-a\left(x_4 - \frac{1}{4}\right)\,\hat{\mathbf{x}} + \frac{1}{8}a\,\hat{\mathbf{y}} + \frac{1}{8}a\,\hat{\mathbf{z}}$	(48f)	Na I
$\mathbf{B_{19}}$	=	$x_4\,\mathbf{a}_1 - \left(x_4 - \frac{1}{4}\right)\,\mathbf{a}_2 + x_4\,\mathbf{a}_3$	=	$\frac{1}{8}a\,\hat{\mathbf{x}} + ax_4\,\hat{\mathbf{y}} + \frac{1}{8}a\,\hat{\mathbf{z}}$	(48f)	Na I
$\mathbf{B_{20}}$	=	$-\left(x_4 - \frac{1}{4}\right)\,\mathbf{a}_1 + x_4\,\mathbf{a}_2 - \left(x_4 - \frac{1}{4}\right)\,\mathbf{a}_3$	=	$\frac{1}{8}a\,\hat{\mathbf{x}} - a\left(x_4 - \frac{1}{4}\right)\,\hat{\mathbf{y}} + \frac{1}{8}a\,\hat{\mathbf{z}}$	(48f)	Na I
$\mathbf{B_{21}}$	=	$x_4\,\mathbf{a}_1 + x_4\,\mathbf{a}_2 - \left(x_4 - \frac{1}{4}\right)\,\mathbf{a}_3$	=	$\frac{1}{8}a\,\hat{\mathbf{x}} + \frac{1}{8}a\,\hat{\mathbf{y}} + ax_4\,\hat{\mathbf{z}}$	(48f)	Na I
$\mathbf{B_{22}}$	=	$-\left(x_4 - \frac{1}{4}\right)\,\mathbf{a}_1 - \left(x_4 - \frac{1}{4}\right)\,\mathbf{a}_2 + x_4\,\mathbf{a}_3$	=	$\frac{1}{8}a\,\hat{\mathbf{x}} + \frac{1}{8}a\,\hat{\mathbf{y}} - a\left(x_4 - \frac{1}{4}\right)\,\hat{\mathbf{z}}$	(48f)	Na I
$\mathbf{B_{23}}$	=	$\left(x_4 + \frac{3}{4}\right)\,\mathbf{a}_1 - x_4\,\mathbf{a}_2 - x_4\,\mathbf{a}_3$	=	$-ax_4\,\hat{\mathbf{x}} + \frac{3}{8}a\,\hat{\mathbf{y}} + \frac{3}{8}a\,\hat{\mathbf{z}}$	(48f)	Na I

$$\mathbf{B_{24}} = -x_4\,\mathbf{a}_1 + \left(x_4+\tfrac{3}{4}\right)\,\mathbf{a}_2 + \left(x_4+\tfrac{3}{4}\right)\,\mathbf{a}_3 = a\left(x_4+\tfrac{3}{4}\right)\,\hat{\mathbf{x}} + \tfrac{3}{8}a\,\hat{\mathbf{y}} + \tfrac{3}{8}a\,\hat{\mathbf{z}} \quad (48f) \quad \text{Na I}$$

$$\mathbf{B_{25}} = -x_4\,\mathbf{a}_1 + \left(x_4+\tfrac{3}{4}\right)\,\mathbf{a}_2 - x_4\,\mathbf{a}_3 = \tfrac{3}{8}a\,\hat{\mathbf{x}} - ax_4\,\hat{\mathbf{y}} + \tfrac{3}{8}a\,\hat{\mathbf{z}} \quad (48f) \quad \text{Na I}$$

$$\mathbf{B_{26}} = \left(x_4+\tfrac{3}{4}\right)\,\mathbf{a}_1 - x_4\,\mathbf{a}_2 + \left(x_4+\tfrac{3}{4}\right)\,\mathbf{a}_3 = \tfrac{3}{8}a\,\hat{\mathbf{x}} + a\left(x_4+\tfrac{3}{4}\right)\,\hat{\mathbf{y}} + \tfrac{3}{8}a\,\hat{\mathbf{z}} \quad (48f) \quad \text{Na I}$$

$$\mathbf{B_{27}} = -x_4\,\mathbf{a}_1 - x_4\,\mathbf{a}_2 + \left(x_4+\tfrac{3}{4}\right)\,\mathbf{a}_3 = \tfrac{3}{8}a\,\hat{\mathbf{x}} + \tfrac{3}{8}a\,\hat{\mathbf{y}} - ax_4\,\hat{\mathbf{z}} \quad (48f) \quad \text{Na I}$$

$$\mathbf{B_{28}} = \left(x_4+\tfrac{3}{4}\right)\,\mathbf{a}_1 + \left(x_4+\tfrac{3}{4}\right)\,\mathbf{a}_2 - x_4\,\mathbf{a}_3 = \tfrac{3}{8}a\,\hat{\mathbf{x}} + \tfrac{3}{8}a\,\hat{\mathbf{y}} + a\left(x_4+\tfrac{3}{4}\right)\,\hat{\mathbf{z}} \quad (48f) \quad \text{Na I}$$

$$\mathbf{B_{29}} = (-x_5+y_5+z_5)\,\mathbf{a}_1 + (x_5-y_5+z_5)\,\mathbf{a}_2 + (x_5+y_5-z_5)\,\mathbf{a}_3 = ax_5\,\hat{\mathbf{x}} + ay_5\,\hat{\mathbf{y}} + az_5\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{30}} = (x_5-y_5+z_5)\,\mathbf{a}_1 + (-x_5+y_5+z_5)\,\mathbf{a}_2 - \left(x_5+y_5+z_5-\tfrac{1}{2}\right)\,\mathbf{a}_3 = -a\left(x_5-\tfrac{1}{4}\right)\,\hat{\mathbf{x}} - a\left(y_5-\tfrac{1}{4}\right)\,\hat{\mathbf{y}} + az_5\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{31}} = (x_5+y_5-z_5)\,\mathbf{a}_1 - \left(x_5+y_5+z_5-\tfrac{1}{2}\right)\,\mathbf{a}_2 + (-x_5+y_5+z_5)\,\mathbf{a}_3 = -a\left(x_5-\tfrac{1}{4}\right)\,\hat{\mathbf{x}} + ay_5\,\hat{\mathbf{y}} - a\left(z_5-\tfrac{1}{4}\right)\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{32}} = -\left(x_5+y_5+z_5-\tfrac{1}{2}\right)\,\mathbf{a}_1 + (x_5+y_5-z_5)\,\mathbf{a}_2 + (x_5-y_5+z_5)\,\mathbf{a}_3 = ax_5\,\hat{\mathbf{x}} - a\left(y_5-\tfrac{1}{4}\right)\,\hat{\mathbf{y}} - a\left(z_5-\tfrac{1}{4}\right)\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{33}} = (x_5+y_5-z_5)\,\mathbf{a}_1 + (-x_5+y_5+z_5)\,\mathbf{a}_2 + (x_5-y_5+z_5)\,\mathbf{a}_3 = az_5\,\hat{\mathbf{x}} + ax_5\,\hat{\mathbf{y}} + ay_5\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{34}} = -\left(x_5+y_5+z_5-\tfrac{1}{2}\right)\,\mathbf{a}_1 + (x_5-y_5+z_5)\,\mathbf{a}_2 + (-x_5+y_5+z_5)\,\mathbf{a}_3 = az_5\,\hat{\mathbf{x}} - a\left(x_5-\tfrac{1}{4}\right)\,\hat{\mathbf{y}} - a\left(y_5-\tfrac{1}{4}\right)\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{35}} = (-x_5+y_5+z_5)\,\mathbf{a}_1 + (x_5+y_5-z_5)\,\mathbf{a}_2 - \left(x_5+y_5+z_5-\tfrac{1}{2}\right)\,\mathbf{a}_3 = -a\left(z_5-\tfrac{1}{4}\right)\,\hat{\mathbf{x}} - a\left(x_5-\tfrac{1}{4}\right)\,\hat{\mathbf{y}} + ay_5\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{36}} = (x_5-y_5+z_5)\,\mathbf{a}_1 - \left(x_5+y_5+z_5-\tfrac{1}{2}\right)\,\mathbf{a}_2 + (x_5+y_5-z_5)\,\mathbf{a}_3 = -a\left(z_5-\tfrac{1}{4}\right)\,\hat{\mathbf{x}} + ax_5\,\hat{\mathbf{y}} - a\left(y_5-\tfrac{1}{4}\right)\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{37}} = (x_5-y_5+z_5)\,\mathbf{a}_1 + (x_5+y_5-z_5)\,\mathbf{a}_2 + (-x_5+y_5+z_5)\,\mathbf{a}_3 = ay_5\,\hat{\mathbf{x}} + az_5\,\hat{\mathbf{y}} + ax_5\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{38}} = (-x_5+y_5+z_5)\,\mathbf{a}_1 - \left(x_5+y_5+z_5-\tfrac{1}{2}\right)\,\mathbf{a}_2 + (x_5-y_5+z_5)\,\mathbf{a}_3 = -a\left(y_5-\tfrac{1}{4}\right)\,\hat{\mathbf{x}} + az_5\,\hat{\mathbf{y}} - a\left(x_5-\tfrac{1}{4}\right)\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{39}} = -\left(x_5+y_5+z_5-\tfrac{1}{2}\right)\,\mathbf{a}_1 + (-x_5+y_5+z_5)\,\mathbf{a}_2 + (x_5+y_5-z_5)\,\mathbf{a}_3 = ay_5\,\hat{\mathbf{x}} - a\left(z_5-\tfrac{1}{4}\right)\,\hat{\mathbf{y}} - a\left(x_5-\tfrac{1}{4}\right)\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{40}} = (x_5+y_5-z_5)\,\mathbf{a}_1 + (x_5-y_5+z_5)\,\mathbf{a}_2 - \left(x_5+y_5+z_5-\tfrac{1}{2}\right)\,\mathbf{a}_3 = -a\left(y_5-\tfrac{1}{4}\right)\,\hat{\mathbf{x}} - a\left(z_5-\tfrac{1}{4}\right)\,\hat{\mathbf{y}} + ax_5\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{41}} = (x_5-y_5-z_5)\,\mathbf{a}_1 - (x_5-y_5+z_5)\,\mathbf{a}_2 - (x_5+y_5-z_5)\,\mathbf{a}_3 = -ax_5\,\hat{\mathbf{x}} - ay_5\,\hat{\mathbf{y}} - az_5\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$$\mathbf{B_{42}} = -(x_5-y_5+z_5)\,\mathbf{a}_1 + (x_5-y_5-z_5)\,\mathbf{a}_2 + \left(x_5+y_5+z_5+\tfrac{1}{2}\right)\,\mathbf{a}_3 = a\left(x_5+\tfrac{1}{4}\right)\,\hat{\mathbf{x}} + a\left(y_5+\tfrac{1}{4}\right)\,\hat{\mathbf{y}} - az_5\,\hat{\mathbf{z}} \quad (96g) \quad \text{O I}$$

$\mathbf{B_{43}}$	=	$-\left(x_5+y_5-z_5\right)\,\mathbf{a}_1+\left(x_5+y_5+z_5+\frac{1}{2}\right)\,\mathbf{a}_2+\left(x_5-y_5-z_5\right)\,\mathbf{a}_3$	=	$a\left(x_5+\frac{1}{4}\right)\,\hat{\mathbf{x}}-ay_5\,\hat{\mathbf{y}}+a\left(z_5+\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(96g)	O I
$\mathbf{B_{44}}$	=	$\left(x_5+y_5+z_5+\frac{1}{2}\right)\,\mathbf{a}_1-\left(x_5+y_5-z_5\right)\,\mathbf{a}_2-\left(x_5-y_5+z_5\right)\,\mathbf{a}_3$	=	$-ax_5\,\hat{\mathbf{x}}+a\left(y_5+\frac{1}{4}\right)\,\hat{\mathbf{y}}+a\left(z_5+\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(96g)	O I
$\mathbf{B_{45}}$	=	$-\left(x_5+y_5-z_5\right)\,\mathbf{a}_1+\left(x_5-y_5-z_5\right)\,\mathbf{a}_2-\left(x_5-y_5+z_5\right)\,\mathbf{a}_3$	=	$-az_5\,\hat{\mathbf{x}}-ax_5\,\hat{\mathbf{y}}-ay_5\,\hat{\mathbf{z}}$	(96g)	O I
$\mathbf{B_{46}}$	=	$\left(x_5+y_5+z_5+\frac{1}{2}\right)\,\mathbf{a}_1-\left(x_5-y_5+z_5\right)\,\mathbf{a}_2+\left(x_5-y_5-z_5\right)\,\mathbf{a}_3$	=	$-az_5\,\hat{\mathbf{x}}+a\left(x_5+\frac{1}{4}\right)\,\hat{\mathbf{y}}+a\left(y_5+\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(96g)	O I
$\mathbf{B_{47}}$	=	$\left(x_5-y_5-z_5\right)\,\mathbf{a}_1-\left(x_5+y_5-z_5\right)\,\mathbf{a}_2+\left(x_5+y_5+z_5+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$a\left(z_5+\frac{1}{4}\right)\,\hat{\mathbf{x}}+a\left(x_5+\frac{1}{4}\right)\,\hat{\mathbf{y}}-ay_5\,\hat{\mathbf{z}}$	(96g)	O I
$\mathbf{B_{48}}$	=	$-\left(x_5-y_5+z_5\right)\,\mathbf{a}_1+\left(x_5+y_5+z_5+\frac{1}{2}\right)\,\mathbf{a}_2-\left(x_5+y_5-z_5\right)\,\mathbf{a}_3$	=	$a\left(z_5+\frac{1}{4}\right)\,\hat{\mathbf{x}}-ax_5\,\hat{\mathbf{y}}+a\left(y_5+\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(96g)	O I
$\mathbf{B_{49}}$	=	$-\left(x_5-y_5+z_5\right)\,\mathbf{a}_1-\left(x_5+y_5-z_5\right)\,\mathbf{a}_2+\left(x_5-y_5-z_5\right)\,\mathbf{a}_3$	=	$-ay_5\,\hat{\mathbf{x}}-az_5\,\hat{\mathbf{y}}-ax_5\,\hat{\mathbf{z}}$	(96g)	O I
$\mathbf{B_{50}}$	=	$\left(x_5-y_5-z_5\right)\,\mathbf{a}_1+\left(x_5+y_5+z_5+\frac{1}{2}\right)\,\mathbf{a}_2-\left(x_5-y_5+z_5\right)\,\mathbf{a}_3$	=	$a\left(y_5+\frac{1}{4}\right)\,\hat{\mathbf{x}}-az_5\,\hat{\mathbf{y}}+a\left(x_5+\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(96g)	O I
$\mathbf{B_{51}}$	=	$\left(x_5+y_5+z_5+\frac{1}{2}\right)\,\mathbf{a}_1+\left(x_5-y_5-z_5\right)\,\mathbf{a}_2-\left(x_5+y_5-z_5\right)\,\mathbf{a}_3$	=	$-ay_5\,\hat{\mathbf{x}}+a\left(z_5+\frac{1}{4}\right)\,\hat{\mathbf{y}}+a\left(x_5+\frac{1}{4}\right)\,\hat{\mathbf{z}}$	(96g)	O I
$\mathbf{B_{52}}$	=	$-\left(x_5+y_5-z_5\right)\,\mathbf{a}_1-\left(x_5-y_5+z_5\right)\,\mathbf{a}_2+\left(x_5+y_5+z_5+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$a\left(y_5+\frac{1}{4}\right)\,\hat{\mathbf{x}}+a\left(z_5+\frac{1}{4}\right)\,\hat{\mathbf{y}}-ax_5\,\hat{\mathbf{z}}$	(96g)	O I

References

[1] Z. Fu, Y. Zheng, Y. Xiao, S. Bedanta, A. Senyshyn, G. G. Simeoni, Y. Su, U. Rücker, P. Kögerler, and T. Brückel, *Coexistence of magnetic order and spin-glass-like phase in the pyrochlore antiferromagnet $Na_3Co(CO_3)_2Cl$*, Phys. Rev. B **87**, 214406 (2013), doi:10.1103/PhysRevB.87.214406.