$Ca_{14}Zn_6Al_{10}O_{35}$ Structure: A12B14C35D4_cF260_196_abeg_2ef_cef2h_e-001

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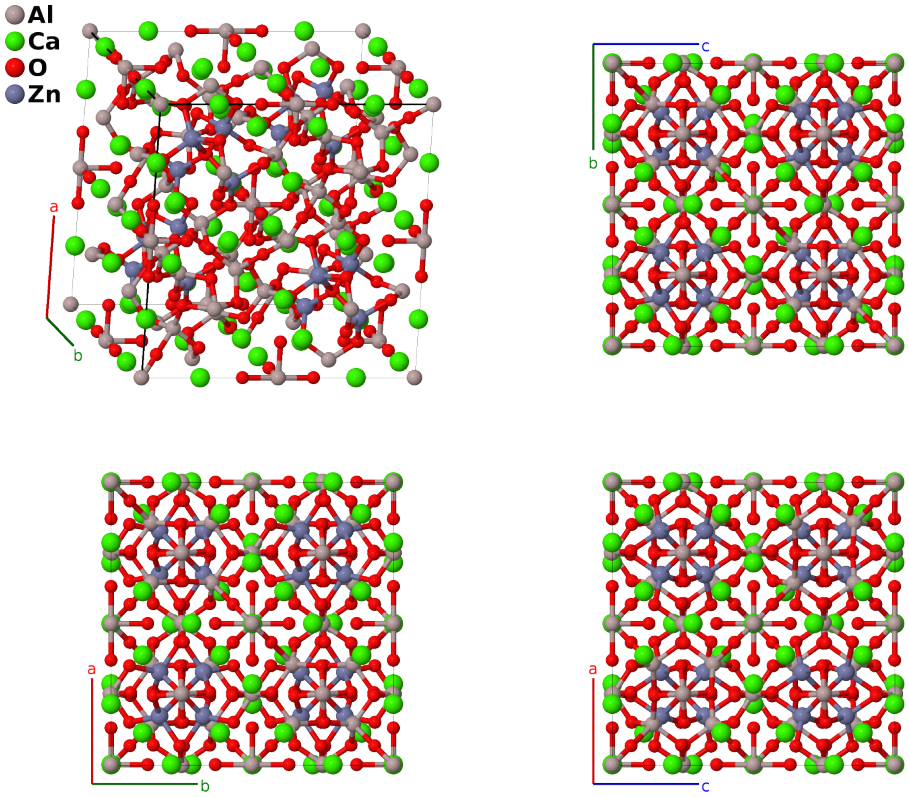
https://aflow.org/p/JELG

https://aflow.org/p/A12B14C35D4_cF260_196_abeg_2ef_cef2h_e-001

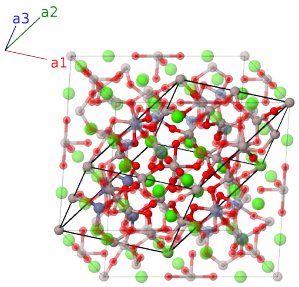


Prototype	$Al_{10}Ca_{14}O_{35}Zn_6$
AFLOW prototype label	A12B14C35D4_cF260_196_abeg_2ef_cef2h_e-001
ICSD	50292
Pearson symbol	cF260
Space group number	196
Space group symbol	$F23$
AFLOW prototype command	`aflow --proto=A12B14C35D4_cF260_196_abeg_2ef_cef2h_e-001 --params=`$a, x_4, x_5, x_6, x_7, x_8, x_9, x_{10}, x_{11}, x_{12}, y_{12}, z_{12}, x_{13}, y_{13}, z_{13}$

- All of the sites labeled "aluminum" are actual 5 parts aluminum and 1 part zinc, giving the observed stoichiometry.

Face-centered Cubic primitive vectors

$$\mathbf{a_1} = \frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$$
$$\mathbf{a_2} = \frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{z}}$$
$$\mathbf{a_3} = \frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}}$$



Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_1}$	=	0	=	0	(4a)	Al I
$\mathbf{B_2}$	=	$\frac{1}{2}\,\mathbf{a}_1 + \frac{1}{2}\,\mathbf{a}_2 + \frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}a\,\hat{\mathbf{y}} + \frac{1}{2}a\,\hat{\mathbf{z}}$	(4b)	Al II
$\mathbf{B_3}$	=	$\frac{1}{4}\,\mathbf{a}_1 + \frac{1}{4}\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(4c)	O I
$\mathbf{B_4}$	=	$x_4\,\mathbf{a}_1 + x_4\,\mathbf{a}_2 + x_4\,\mathbf{a}_3$	=	$ax_4\,\hat{\mathbf{x}} + ax_4\,\hat{\mathbf{y}} + ax_4\,\hat{\mathbf{z}}$	(16e)	Al III
$\mathbf{B_5}$	=	$x_4\,\mathbf{a}_1 + x_4\,\mathbf{a}_2 - 3x_4\,\mathbf{a}_3$	=	$-ax_4\,\hat{\mathbf{x}} - ax_4\,\hat{\mathbf{y}} + ax_4\,\hat{\mathbf{z}}$	(16e)	Al III
$\mathbf{B_6}$	=	$x_4\,\mathbf{a}_1 - 3x_4\,\mathbf{a}_2 + x_4\,\mathbf{a}_3$	=	$-ax_4\,\hat{\mathbf{x}} + ax_4\,\hat{\mathbf{y}} - ax_4\,\hat{\mathbf{z}}$	(16e)	Al III
$\mathbf{B_7}$	=	$-3x_4\,\mathbf{a}_1 + x_4\,\mathbf{a}_2 + x_4\,\mathbf{a}_3$	=	$ax_4\,\hat{\mathbf{x}} - ax_4\,\hat{\mathbf{y}} - ax_4\,\hat{\mathbf{z}}$	(16e)	Al III
$\mathbf{B_8}$	=	$x_5\,\mathbf{a}_1 + x_5\,\mathbf{a}_2 + x_5\,\mathbf{a}_3$	=	$ax_5\,\hat{\mathbf{x}} + ax_5\,\hat{\mathbf{y}} + ax_5\,\hat{\mathbf{z}}$	(16e)	Ca I
$\mathbf{B_9}$	=	$x_5\,\mathbf{a}_1 + x_5\,\mathbf{a}_2 - 3x_5\,\mathbf{a}_3$	=	$-ax_5\,\hat{\mathbf{x}} - ax_5\,\hat{\mathbf{y}} + ax_5\,\hat{\mathbf{z}}$	(16e)	Ca I
$\mathbf{B_{10}}$	=	$x_5\,\mathbf{a}_1 - 3x_5\,\mathbf{a}_2 + x_5\,\mathbf{a}_3$	=	$-ax_5\,\hat{\mathbf{x}} + ax_5\,\hat{\mathbf{y}} - ax_5\,\hat{\mathbf{z}}$	(16e)	Ca I
$\mathbf{B_{11}}$	=	$-3x_5\,\mathbf{a}_1 + x_5\,\mathbf{a}_2 + x_5\,\mathbf{a}_3$	=	$ax_5\,\hat{\mathbf{x}} - ax_5\,\hat{\mathbf{y}} - ax_5\,\hat{\mathbf{z}}$	(16e)	Ca I
$\mathbf{B_{12}}$	=	$x_6\,\mathbf{a}_1 + x_6\,\mathbf{a}_2 + x_6\,\mathbf{a}_3$	=	$ax_6\,\hat{\mathbf{x}} + ax_6\,\hat{\mathbf{y}} + ax_6\,\hat{\mathbf{z}}$	(16e)	Ca II
$\mathbf{B_{13}}$	=	$x_6\,\mathbf{a}_1 + x_6\,\mathbf{a}_2 - 3x_6\,\mathbf{a}_3$	=	$-ax_6\,\hat{\mathbf{x}} - ax_6\,\hat{\mathbf{y}} + ax_6\,\hat{\mathbf{z}}$	(16e)	Ca II
$\mathbf{B_{14}}$	=	$x_6\,\mathbf{a}_1 - 3x_6\,\mathbf{a}_2 + x_6\,\mathbf{a}_3$	=	$-ax_6\,\hat{\mathbf{x}} + ax_6\,\hat{\mathbf{y}} - ax_6\,\hat{\mathbf{z}}$	(16e)	Ca II
$\mathbf{B_{15}}$	=	$-3x_6\,\mathbf{a}_1 + x_6\,\mathbf{a}_2 + x_6\,\mathbf{a}_3$	=	$ax_6\,\hat{\mathbf{x}} - ax_6\,\hat{\mathbf{y}} - ax_6\,\hat{\mathbf{z}}$	(16e)	Ca II
$\mathbf{B_{16}}$	=	$x_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 + x_7\,\mathbf{a}_3$	=	$ax_7\,\hat{\mathbf{x}} + ax_7\,\hat{\mathbf{y}} + ax_7\,\hat{\mathbf{z}}$	(16e)	O II
$\mathbf{B_{17}}$	=	$x_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 - 3x_7\,\mathbf{a}_3$	=	$-ax_7\,\hat{\mathbf{x}} - ax_7\,\hat{\mathbf{y}} + ax_7\,\hat{\mathbf{z}}$	(16e)	O II
$\mathbf{B_{18}}$	=	$x_7\,\mathbf{a}_1 - 3x_7\,\mathbf{a}_2 + x_7\,\mathbf{a}_3$	=	$-ax_7\,\hat{\mathbf{x}} + ax_7\,\hat{\mathbf{y}} - ax_7\,\hat{\mathbf{z}}$	(16e)	O II
$\mathbf{B_{19}}$	=	$-3x_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 + x_7\,\mathbf{a}_3$	=	$ax_7\,\hat{\mathbf{x}} - ax_7\,\hat{\mathbf{y}} - ax_7\,\hat{\mathbf{z}}$	(16e)	O II
$\mathbf{B_{20}}$	=	$x_8\,\mathbf{a}_1 + x_8\,\mathbf{a}_2 + x_8\,\mathbf{a}_3$	=	$ax_8\,\hat{\mathbf{x}} + ax_8\,\hat{\mathbf{y}} + ax_8\,\hat{\mathbf{z}}$	(16e)	Zn I
$\mathbf{B_{21}}$	=	$x_8\,\mathbf{a}_1 + x_8\,\mathbf{a}_2 - 3x_8\,\mathbf{a}_3$	=	$-ax_8\,\hat{\mathbf{x}} - ax_8\,\hat{\mathbf{y}} + ax_8\,\hat{\mathbf{z}}$	(16e)	Zn I
$\mathbf{B_{22}}$	=	$x_8\,\mathbf{a}_1 - 3x_8\,\mathbf{a}_2 + x_8\,\mathbf{a}_3$	=	$-ax_8\,\hat{\mathbf{x}} + ax_8\,\hat{\mathbf{y}} - ax_8\,\hat{\mathbf{z}}$	(16e)	Zn I
$\mathbf{B_{23}}$	=	$-3x_8\,\mathbf{a}_1 + x_8\,\mathbf{a}_2 + x_8\,\mathbf{a}_3$	=	$ax_8\,\hat{\mathbf{x}} - ax_8\,\hat{\mathbf{y}} - ax_8\,\hat{\mathbf{z}}$	(16e)	Zn I
$\mathbf{B_{24}}$	=	$-x_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 + x_9\,\mathbf{a}_3$	=	$ax_9\,\hat{\mathbf{x}}$	(24f)	Ca III
$\mathbf{B_{25}}$	=	$x_9\,\mathbf{a}_1 - x_9\,\mathbf{a}_2 - x_9\,\mathbf{a}_3$	=	$-ax_9\,\hat{\mathbf{x}}$	(24f)	Ca III
$\mathbf{B_{26}}$	=	$x_9\,\mathbf{a}_1 - x_9\,\mathbf{a}_2 + x_9\,\mathbf{a}_3$	=	$ax_9\,\hat{\mathbf{y}}$	(24f)	Ca III
$\mathbf{B_{27}}$	=	$-x_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 - x_9\,\mathbf{a}_3$	=	$-ax_9\,\hat{\mathbf{y}}$	(24f)	Ca III
$\mathbf{B_{28}}$	=	$x_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 - x_9\,\mathbf{a}_3$	=	$ax_9\,\hat{\mathbf{z}}$	(24f)	Ca III

$\mathbf{B_{29}}$	=	$-x_9\,\mathbf{a}_1 - x_9\,\mathbf{a}_2 + x_9\,\mathbf{a}_3$	=	$-ax_9\,\hat{\mathbf{z}}$	(24f)	Ca III
$\mathbf{B_{30}}$	=	$-x_{10}\,\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 + x_{10}\,\mathbf{a}_3$	=	$ax_{10}\,\hat{\mathbf{x}}$	(24f)	O III
$\mathbf{B_{31}}$	=	$x_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 - x_{10}\,\mathbf{a}_3$	=	$-ax_{10}\,\hat{\mathbf{x}}$	(24f)	O III
$\mathbf{B_{32}}$	=	$x_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 + x_{10}\,\mathbf{a}_3$	=	$ax_{10}\,\hat{\mathbf{y}}$	(24f)	O III
$\mathbf{B_{33}}$	=	$-x_{10}\,\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 - x_{10}\,\mathbf{a}_3$	=	$-ax_{10}\,\hat{\mathbf{y}}$	(24f)	O III
$\mathbf{B_{34}}$	=	$x_{10}\,\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 - x_{10}\,\mathbf{a}_3$	=	$ax_{10}\,\hat{\mathbf{z}}$	(24f)	O III
$\mathbf{B_{35}}$	=	$-x_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 + x_{10}\,\mathbf{a}_3$	=	$-ax_{10}\,\hat{\mathbf{z}}$	(24f)	O III
$\mathbf{B_{36}}$	=	$-\left(x_{11} - \frac{1}{2}\right)\,\mathbf{a}_1 + x_{11}\,\mathbf{a}_2 + x_{11}\,\mathbf{a}_3$	=	$ax_{11}\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Al IV
$\mathbf{B_{37}}$	=	$x_{11}\,\mathbf{a}_1 - \left(x_{11} - \frac{1}{2}\right)\,\mathbf{a}_2 - \left(x_{11} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-a\left(x_{11} - \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Al IV
$\mathbf{B_{38}}$	=	$x_{11}\,\mathbf{a}_1 - \left(x_{11} - \frac{1}{2}\right)\,\mathbf{a}_2 + x_{11}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + ax_{11}\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Al IV
$\mathbf{B_{39}}$	=	$-\left(x_{11} - \frac{1}{2}\right)\,\mathbf{a}_1 + x_{11}\,\mathbf{a}_2 - \left(x_{11} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} - a\left(x_{11} - \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Al IV
$\mathbf{B_{40}}$	=	$x_{11}\,\mathbf{a}_1 + x_{11}\,\mathbf{a}_2 - \left(x_{11} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + ax_{11}\,\hat{\mathbf{z}}$	(24g)	Al IV
$\mathbf{B_{41}}$	=	$-\left(x_{11} - \frac{1}{2}\right)\,\mathbf{a}_1 - \left(x_{11} - \frac{1}{2}\right)\,\mathbf{a}_2 + x_{11}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} - a\left(x_{11} - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(24g)	Al IV
$\mathbf{B_{42}}$	=	$(-x_{12} + y_{12} + z_{12})\,\mathbf{a}_1 + (x_{12} - y_{12} + z_{12})\,\mathbf{a}_2 + (x_{12} + y_{12} - z_{12})\,\mathbf{a}_3$	=	$ax_{12}\,\hat{\mathbf{x}} + ay_{12}\,\hat{\mathbf{y}} + az_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{43}}$	=	$(x_{12} - y_{12} + z_{12})\,\mathbf{a}_1 + (-x_{12} + y_{12} + z_{12})\,\mathbf{a}_2 - (x_{12} + y_{12} + z_{12})\,\mathbf{a}_3$	=	$-ax_{12}\,\hat{\mathbf{x}} - ay_{12}\,\hat{\mathbf{y}} + az_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{44}}$	=	$(x_{12} + y_{12} - z_{12})\,\mathbf{a}_1 - (x_{12} + y_{12} + z_{12})\,\mathbf{a}_2 + (-x_{12} + y_{12} + z_{12})\,\mathbf{a}_3$	=	$-ax_{12}\,\hat{\mathbf{x}} + ay_{12}\,\hat{\mathbf{y}} - az_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{45}}$	=	$-(x_{12} + y_{12} + z_{12})\,\mathbf{a}_1 + (x_{12} + y_{12} - z_{12})\,\mathbf{a}_2 + (x_{12} - y_{12} + z_{12})\,\mathbf{a}_3$	=	$ax_{12}\,\hat{\mathbf{x}} - ay_{12}\,\hat{\mathbf{y}} - az_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{46}}$	=	$(x_{12} + y_{12} - z_{12})\,\mathbf{a}_1 + (-x_{12} + y_{12} + z_{12})\,\mathbf{a}_2 + (x_{12} - y_{12} + z_{12})\,\mathbf{a}_3$	=	$az_{12}\,\hat{\mathbf{x}} + ax_{12}\,\hat{\mathbf{y}} + ay_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{47}}$	=	$-(x_{12} + y_{12} + z_{12})\,\mathbf{a}_1 + (x_{12} - y_{12} + z_{12})\,\mathbf{a}_2 + (-x_{12} + y_{12} + z_{12})\,\mathbf{a}_3$	=	$az_{12}\,\hat{\mathbf{x}} - ax_{12}\,\hat{\mathbf{y}} - ay_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{48}}$	=	$(-x_{12} + y_{12} + z_{12})\,\mathbf{a}_1 + (x_{12} + y_{12} - z_{12})\,\mathbf{a}_2 - (x_{12} + y_{12} + z_{12})\,\mathbf{a}_3$	=	$-az_{12}\,\hat{\mathbf{x}} - ax_{12}\,\hat{\mathbf{y}} + ay_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{49}}$	=	$(x_{12} - y_{12} + z_{12})\,\mathbf{a}_1 - (x_{12} + y_{12} + z_{12})\,\mathbf{a}_2 + (x_{12} + y_{12} - z_{12})\,\mathbf{a}_3$	=	$-az_{12}\,\hat{\mathbf{x}} + ax_{12}\,\hat{\mathbf{y}} - ay_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{50}}$	=	$(x_{12} - y_{12} + z_{12})\,\mathbf{a}_1 + (x_{12} + y_{12} - z_{12})\,\mathbf{a}_2 + (-x_{12} + y_{12} + z_{12})\,\mathbf{a}_3$	=	$ay_{12}\,\hat{\mathbf{x}} + az_{12}\,\hat{\mathbf{y}} + ax_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{51}}$	=	$(-x_{12} + y_{12} + z_{12})\,\mathbf{a}_1 - (x_{12} + y_{12} + z_{12})\,\mathbf{a}_2 + (x_{12} - y_{12} + z_{12})\,\mathbf{a}_3$	=	$-ay_{12}\,\hat{\mathbf{x}} + az_{12}\,\hat{\mathbf{y}} - ax_{12}\,\hat{\mathbf{z}}$	(48h)	O IV

$\mathbf{B_{52}}$	=	$-(x_{12}+y_{12}+z_{12})\,\mathbf{a}_1+(-x_{12}+y_{12}+z_{12})\,\mathbf{a}_2+(x_{12}+y_{12}-z_{12})\,\mathbf{a}_3$	=	$ay_{12}\,\hat{\mathbf{x}}-az_{12}\,\hat{\mathbf{y}}-ax_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{53}}$	=	$(x_{12}+y_{12}-z_{12})\,\mathbf{a}_1+(x_{12}-y_{12}+z_{12})\,\mathbf{a}_2-(x_{12}+y_{12}+z_{12})\,\mathbf{a}_3$	=	$-ay_{12}\,\hat{\mathbf{x}}-az_{12}\,\hat{\mathbf{y}}+ax_{12}\,\hat{\mathbf{z}}$	(48h)	O IV
$\mathbf{B_{54}}$	=	$(-x_{13}+y_{13}+z_{13})\,\mathbf{a}_1+(x_{13}-y_{13}+z_{13})\,\mathbf{a}_2+(x_{13}+y_{13}-z_{13})\,\mathbf{a}_3$	=	$ax_{13}\,\hat{\mathbf{x}}+ay_{13}\,\hat{\mathbf{y}}+az_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{55}}$	=	$(x_{13}-y_{13}+z_{13})\,\mathbf{a}_1+(-x_{13}+y_{13}+z_{13})\,\mathbf{a}_2-(x_{13}+y_{13}+z_{13})\,\mathbf{a}_3$	=	$-ax_{13}\,\hat{\mathbf{x}}-ay_{13}\,\hat{\mathbf{y}}+az_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{56}}$	=	$(x_{13}+y_{13}-z_{13})\,\mathbf{a}_1-(x_{13}+y_{13}+z_{13})\,\mathbf{a}_2+(-x_{13}+y_{13}+z_{13})\,\mathbf{a}_3$	=	$-ax_{13}\,\hat{\mathbf{x}}+ay_{13}\,\hat{\mathbf{y}}-az_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{57}}$	=	$-(x_{13}+y_{13}+z_{13})\,\mathbf{a}_1+(x_{13}+y_{13}-z_{13})\,\mathbf{a}_2+(x_{13}-y_{13}+z_{13})\,\mathbf{a}_3$	=	$ax_{13}\,\hat{\mathbf{x}}-ay_{13}\,\hat{\mathbf{y}}-az_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{58}}$	=	$(x_{13}+y_{13}-z_{13})\,\mathbf{a}_1+(-x_{13}+y_{13}+z_{13})\,\mathbf{a}_2+(x_{13}-y_{13}+z_{13})\,\mathbf{a}_3$	=	$az_{13}\,\hat{\mathbf{x}}+ax_{13}\,\hat{\mathbf{y}}+ay_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{59}}$	=	$-(x_{13}+y_{13}+z_{13})\,\mathbf{a}_1+(x_{13}-y_{13}+z_{13})\,\mathbf{a}_2+(-x_{13}+y_{13}+z_{13})\,\mathbf{a}_3$	=	$az_{13}\,\hat{\mathbf{x}}-ax_{13}\,\hat{\mathbf{y}}-ay_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{60}}$	=	$(-x_{13}+y_{13}+z_{13})\,\mathbf{a}_1+(x_{13}+y_{13}-z_{13})\,\mathbf{a}_2-(x_{13}+y_{13}+z_{13})\,\mathbf{a}_3$	=	$-az_{13}\,\hat{\mathbf{x}}-ax_{13}\,\hat{\mathbf{y}}+ay_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{61}}$	=	$(x_{13}-y_{13}+z_{13})\,\mathbf{a}_1-(x_{13}+y_{13}+z_{13})\,\mathbf{a}_2+(x_{13}+y_{13}-z_{13})\,\mathbf{a}_3$	=	$-az_{13}\,\hat{\mathbf{x}}+ax_{13}\,\hat{\mathbf{y}}-ay_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{62}}$	=	$(x_{13}-y_{13}+z_{13})\,\mathbf{a}_1+(x_{13}+y_{13}-z_{13})\,\mathbf{a}_2+(-x_{13}+y_{13}+z_{13})\,\mathbf{a}_3$	=	$ay_{13}\,\hat{\mathbf{x}}+az_{13}\,\hat{\mathbf{y}}+ax_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{63}}$	=	$(-x_{13}+y_{13}+z_{13})\,\mathbf{a}_1-(x_{13}+y_{13}+z_{13})\,\mathbf{a}_2+(x_{13}-y_{13}+z_{13})\,\mathbf{a}_3$	=	$-ay_{13}\,\hat{\mathbf{x}}+az_{13}\,\hat{\mathbf{y}}-ax_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{64}}$	=	$-(x_{13}+y_{13}+z_{13})\,\mathbf{a}_1+(-x_{13}+y_{13}+z_{13})\,\mathbf{a}_2+(x_{13}+y_{13}-z_{13})\,\mathbf{a}_3$	=	$ay_{13}\,\hat{\mathbf{x}}-az_{13}\,\hat{\mathbf{y}}-ax_{13}\,\hat{\mathbf{z}}$	(48h)	O V
$\mathbf{B_{65}}$	=	$(x_{13}+y_{13}-z_{13})\,\mathbf{a}_1+(x_{13}-y_{13}+z_{13})\,\mathbf{a}_2-(x_{13}+y_{13}+z_{13})\,\mathbf{a}_3$	=	$-ay_{13}\,\hat{\mathbf{x}}-az_{13}\,\hat{\mathbf{y}}+ax_{13}\,\hat{\mathbf{z}}$	(48h)	O V

References

[1] V. D. Barbanyagre, T. I. Timoshenko, A. M. Il'inets, and V. M. Shamshurov, *Calcium aluminozincates of $Ca_xAl_yZn_kO_n$ composition*, Powder Diff. **12**, 22–26 (1997), doi:10.1017/S0885715600009398.

Found in

[1] *ICSD, Inorganic Crystal Structure Database. ID 50292.*