Magnetoplumbite ($PbFe_{12}O_{19}$) Structure: A12B19C_hP64_194_ab2fk_efh2k_c-001

This structure previously used the label(s) `A12B19C_hP64_194_ab2fk_efh2k_d`. Calls to these addresses will be redirected here.

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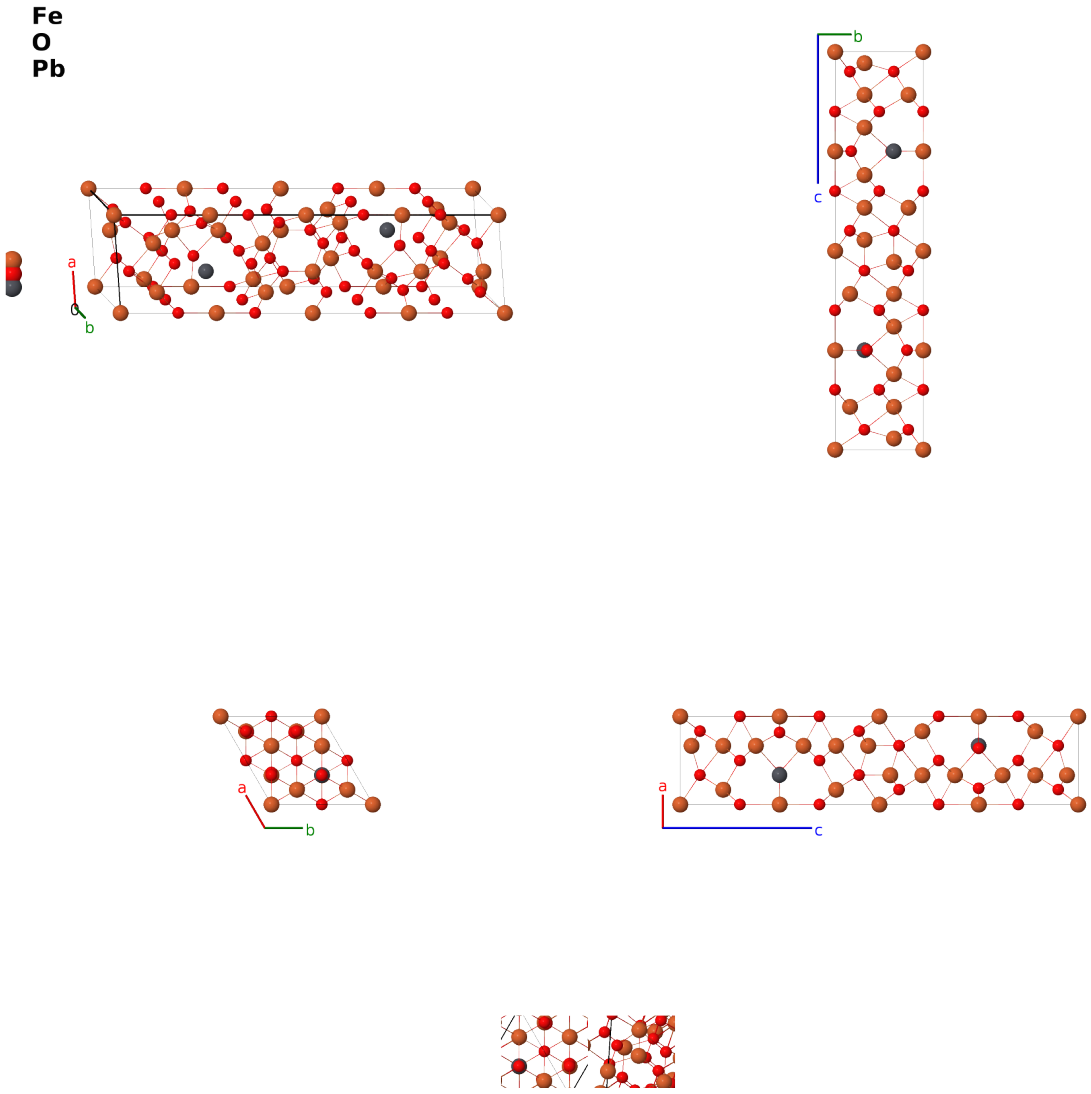
https://aflow.org/prototype-encyclopedia/5L5V

https://aflow.org/prototype-encyclopedia/A12B19C_hP64_194_ab2fk_efh2k_c-001



Prototype	$Fe_{12}O_{19}Pb$
AFLOW prototype label	A12B19C_hP64_194_ab2fk_efh2k_c-001
Mineral name	magnetoplumbite

ICSD	36259
CCDC	1608021
Pearson symbol	hP64
Space group number	194
Space group symbol	$P6_3/mmc$
AFLOW prototype command	`aflow --proto=A12B19C_hP64_194_ab2fk_efh2k_c-001 --params=`$a, c/a, z_4, z_5, z_6, z_7, x_8, x_9, z_9, x_{10}, z_{10}, x_{11}, z_{11}$

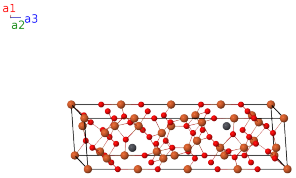
Other compounds with this structure

$PbAl_{12}O_{19}$, $PbGa_{12}O_{19}$, $PbMn_{12}O_{19}$, $Pb(Co,\ Ti)_{12}O_{19}$, $BaAl_{12}O_{19}$, $BaFe_{12}O_{19}$, $BaGa_{12}O_{19}$, $BaMn_{12}O_{19}$, $Ba(Co,\ Ti)_{12}O_{19}$, $CaAl_{12}O_{19}$, $CaGa_{12}O_{19}$, $CaMn_{12}O_{19}$, $Ca(Co,\ Ti)_{12}O_{19}$, $SrAl_{12}O_{19}$, $SrGa_{12}O_{19}$, $SrMn_{12}O_{19}$, $Sr(Co,\ Ti)_{12}O_{19}$

- In addition to the listed compounds, the lead and iron sites may be alloyed with a wide variety of metals and semi-metals resulting in high-entropy phases (Vinnik, 2019).
- We did not find an ICSD or CCDC entry for (Simsa, 1994). We use the ICSD entry from the early work of (Adelskoeld, 1938).

Hexagonal primitive vectors

$$\mathbf{a_1} = \frac{1}{2}a\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}a\,\hat{\mathbf{y}}$$
$$\mathbf{a_2} = \frac{1}{2}a\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}a\,\hat{\mathbf{y}}$$
$$\mathbf{a_3} = c\,\hat{\mathbf{z}}$$



Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_1}$	=	0	=	0	(2a)	Fe I
$\mathbf{B_2}$	=	$\frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}c\,\hat{\mathbf{z}}$	(2a)	Fe I
$\mathbf{B_3}$	=	$\frac{1}{4}\,\mathbf{a}_3$	=	$\frac{1}{4}c\,\hat{\mathbf{z}}$	(2b)	Fe II
$\mathbf{B_4}$	=	$\frac{3}{4}\,\mathbf{a}_3$	=	$\frac{3}{4}c\,\hat{\mathbf{z}}$	(2b)	Fe II
$\mathbf{B_5}$	=	$\frac{1}{3}\,\mathbf{a}_1 + \frac{2}{3}\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(2c)	Pb I
$\mathbf{B_6}$	=	$\frac{2}{3}\,\mathbf{a}_1 + \frac{1}{3}\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} + \frac{3}{4}c\,\hat{\mathbf{z}}$	(2c)	Pb I
$\mathbf{B_7}$	=	$z_4\,\mathbf{a}_3$	=	$cz_4\,\hat{\mathbf{z}}$	(4e)	O I
$\mathbf{B_8}$	=	$\left(z_4 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$c\left(z_4 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(4e)	O I
$\mathbf{B_9}$	=	$-z_4\,\mathbf{a}_3$	=	$-cz_4\,\hat{\mathbf{z}}$	(4e)	O I
$\mathbf{B_{10}}$	=	$-\left(z_4 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-c\left(z_4 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(4e)	O I
$\mathbf{B_{11}}$	=	$\frac{1}{3}\,\mathbf{a}_1 + \frac{2}{3}\,\mathbf{a}_2 + z_5\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} + cz_5\,\hat{\mathbf{z}}$	(4f)	Fe III
$\mathbf{B_{12}}$	=	$\frac{2}{3}\,\mathbf{a}_1 + \frac{1}{3}\,\mathbf{a}_2 + \left(z_5 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} + c\left(z_5 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(4f)	Fe III

$\mathbf{B_{13}}$	=	$\frac{2}{3}\,\mathbf{a}_1 + \frac{1}{3}\,\mathbf{a}_2 - z_5\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} - cz_5\,\hat{\mathbf{z}}$	(4f)	Fe III
$\mathbf{B_{14}}$	=	$\frac{1}{3}\,\mathbf{a}_1 + \frac{2}{3}\,\mathbf{a}_2 - \left(z_5 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} - c\left(z_5 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(4f)	Fe III
$\mathbf{B_{15}}$	=	$\frac{1}{3}\,\mathbf{a}_1 + \frac{2}{3}\,\mathbf{a}_2 + z_6\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} + cz_6\,\hat{\mathbf{z}}$	(4f)	Fe IV
$\mathbf{B_{16}}$	=	$\frac{2}{3}\,\mathbf{a}_1 + \frac{1}{3}\,\mathbf{a}_2 + \left(z_6 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} + c\left(z_6 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(4f)	Fe IV
$\mathbf{B_{17}}$	=	$\frac{2}{3}\,\mathbf{a}_1 + \frac{1}{3}\,\mathbf{a}_2 - z_6\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} - cz_6\,\hat{\mathbf{z}}$	(4f)	Fe IV
$\mathbf{B_{18}}$	=	$\frac{1}{3}\,\mathbf{a}_1 + \frac{2}{3}\,\mathbf{a}_2 - \left(z_6 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} - c\left(z_6 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(4f)	Fe IV
$\mathbf{B_{19}}$	=	$\frac{1}{3}\,\mathbf{a}_1 + \frac{2}{3}\,\mathbf{a}_2 + z_7\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} + cz_7\,\hat{\mathbf{z}}$	(4f)	O II
$\mathbf{B_{20}}$	=	$\frac{2}{3}\,\mathbf{a}_1 + \frac{1}{3}\,\mathbf{a}_2 + \left(z_7 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} + c\left(z_7 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(4f)	O II
$\mathbf{B_{21}}$	=	$\frac{2}{3}\,\mathbf{a}_1 + \frac{1}{3}\,\mathbf{a}_2 - z_7\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} - cz_7\,\hat{\mathbf{z}}$	(4f)	O II
$\mathbf{B_{22}}$	=	$\frac{1}{3}\,\mathbf{a}_1 + \frac{2}{3}\,\mathbf{a}_2 - \left(z_7 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{2}a\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{6}a\,\hat{\mathbf{y}} - c\left(z_7 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(4f)	O II
$\mathbf{B_{23}}$	=	$x_8\,\mathbf{a}_1 + 2x_8\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{3}{2}ax_8\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_8\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(6h)	O III
$\mathbf{B_{24}}$	=	$-2x_8\,\mathbf{a}_1 - x_8\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_8\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_8\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(6h)	O III
$\mathbf{B_{25}}$	=	$x_8\,\mathbf{a}_1 - x_8\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$-\sqrt{3}ax_8\,\hat{\mathbf{y}} + \frac{1}{4}c\,\hat{\mathbf{z}}$	(6h)	O III
$\mathbf{B_{26}}$	=	$-x_8\,\mathbf{a}_1 - 2x_8\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_8\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_8\,\hat{\mathbf{y}} + \frac{3}{4}c\,\hat{\mathbf{z}}$	(6h)	O III
$\mathbf{B_{27}}$	=	$2x_8\,\mathbf{a}_1 + x_8\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$\frac{3}{2}ax_8\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_8\,\hat{\mathbf{y}} + \frac{3}{4}c\,\hat{\mathbf{z}}$	(6h)	O III
$\mathbf{B_{28}}$	=	$-x_8\,\mathbf{a}_1 + x_8\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$\sqrt{3}ax_8\,\hat{\mathbf{y}} + \frac{3}{4}c\,\hat{\mathbf{z}}$	(6h)	O III
$\mathbf{B_{29}}$	=	$x_9\,\mathbf{a}_1 + 2x_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3$	=	$\frac{3}{2}ax_9\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{30}}$	=	$-2x_9\,\mathbf{a}_1 - x_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_9\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{31}}$	=	$x_9\,\mathbf{a}_1 - x_9\,\mathbf{a}_2 + z_9\,\mathbf{a}_3$	=	$-\sqrt{3}ax_9\,\hat{\mathbf{y}} + cz_9\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{32}}$	=	$-x_9\,\mathbf{a}_1 - 2x_9\,\mathbf{a}_2 + \left(z_9 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_9\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} + c\left(z_9 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{33}}$	=	$2x_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 + \left(z_9 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{3}{2}ax_9\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} + c\left(z_9 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{34}}$	=	$-x_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 + \left(z_9 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\sqrt{3}ax_9\,\hat{\mathbf{y}} + c\left(z_9 + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{35}}$	=	$2x_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 - z_9\,\mathbf{a}_3$	=	$\frac{3}{2}ax_9\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{36}}$	=	$-x_9\,\mathbf{a}_1 - 2x_9\,\mathbf{a}_2 - z_9\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_9\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{37}}$	=	$-x_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 - z_9\,\mathbf{a}_3$	=	$\sqrt{3}ax_9\,\hat{\mathbf{y}} - cz_9\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{38}}$	=	$-2x_9\,\mathbf{a}_1 - x_9\,\mathbf{a}_2 - \left(z_9 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_9\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} - c\left(z_9 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{39}}$	=	$x_9\,\mathbf{a}_1 + 2x_9\,\mathbf{a}_2 - \left(z_9 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{3}{2}ax_9\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_9\,\hat{\mathbf{y}} - c\left(z_9 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{40}}$	=	$x_9\,\mathbf{a}_1 - x_9\,\mathbf{a}_2 - \left(z_9 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\sqrt{3}ax_9\,\hat{\mathbf{y}} - c\left(z_9 - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	Fe V
$\mathbf{B_{41}}$	=	$x_{10}\,\mathbf{a}_1 + 2x_{10}\,\mathbf{a}_2 + z_{10}\,\mathbf{a}_3$	=	$\frac{3}{2}ax_{10}\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_{10}\,\hat{\mathbf{y}} + cz_{10}\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{42}}$	=	$-2x_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 + z_{10}\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_{10}\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_{10}\,\hat{\mathbf{y}} + cz_{10}\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{43}}$	=	$x_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 + z_{10}\,\mathbf{a}_3$	=	$-\sqrt{3}ax_{10}\,\hat{\mathbf{y}} + cz_{10}\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{44}}$	=	$-x_{10}\,\mathbf{a}_1 - 2x_{10}\,\mathbf{a}_2 + \left(z_{10} + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_{10}\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_{10}\,\hat{\mathbf{y}} + c\left(z_{10} + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{45}}$	=	$2x_{10}\,\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 + \left(z_{10} + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{3}{2}ax_{10}\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_{10}\,\hat{\mathbf{y}} + c\left(z_{10} + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{46}}$	=	$-x_{10}\,\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 + \left(z_{10} + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\sqrt{3}ax_{10}\,\hat{\mathbf{y}} + c\left(z_{10} + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{47}}$	=	$2x_{10}\,\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 - z_{10}\,\mathbf{a}_3$	=	$\frac{3}{2}ax_{10}\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_{10}\,\hat{\mathbf{y}} - cz_{10}\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{48}}$	=	$-x_{10}\,\mathbf{a}_1 - 2x_{10}\,\mathbf{a}_2 - z_{10}\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_{10}\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_{10}\,\hat{\mathbf{y}} - cz_{10}\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{49}}$	=	$-x_{10}\,\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 - z_{10}\,\mathbf{a}_3$	=	$\sqrt{3}ax_{10}\,\hat{\mathbf{y}} - cz_{10}\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{50}}$	=	$-2x_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 - \left(z_{10} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_{10}\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_{10}\,\hat{\mathbf{y}} - c\left(z_{10} - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{51}}$	=	$x_{10}\,\mathbf{a}_1 + 2x_{10}\,\mathbf{a}_2 - \left(z_{10} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{3}{2}ax_{10}\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_{10}\,\hat{\mathbf{y}} - c\left(z_{10} - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{52}}$	=	$x_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 - \left(z_{10} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\sqrt{3}ax_{10}\,\hat{\mathbf{y}} - c\left(z_{10} - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O IV
$\mathbf{B_{53}}$	=	$x_{11}\,\mathbf{a}_1 + 2x_{11}\,\mathbf{a}_2 + z_{11}\,\mathbf{a}_3$	=	$\frac{3}{2}ax_{11}\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_{11}\,\hat{\mathbf{y}} + cz_{11}\,\hat{\mathbf{z}}$	(12k)	O V

$\mathbf{B_{54}}$	=	$-2x_{11}\,\mathbf{a}_1 - x_{11}\,\mathbf{a}_2 + z_{11}\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_{11}\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_{11}\,\hat{\mathbf{y}} + cz_{11}\,\hat{\mathbf{z}}$	(12k)	O V
$\mathbf{B_{55}}$	=	$x_{11}\,\mathbf{a}_1 - x_{11}\,\mathbf{a}_2 + z_{11}\,\mathbf{a}_3$	=	$-\sqrt{3}ax_{11}\,\hat{\mathbf{y}} + cz_{11}\,\hat{\mathbf{z}}$	(12k)	O V
$\mathbf{B_{56}}$	=	$-x_{11}\,\mathbf{a}_1 - 2x_{11}\,\mathbf{a}_2 + \left(z_{11} + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_{11}\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_{11}\,\hat{\mathbf{y}} + c\left(z_{11} + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O V
$\mathbf{B_{57}}$	=	$2x_{11}\,\mathbf{a}_1 + x_{11}\,\mathbf{a}_2 + \left(z_{11} + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{3}{2}ax_{11}\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_{11}\,\hat{\mathbf{y}} + c\left(z_{11} + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O V
$\mathbf{B_{58}}$	=	$-x_{11}\,\mathbf{a}_1 + x_{11}\,\mathbf{a}_2 + \left(z_{11} + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\sqrt{3}ax_{11}\,\hat{\mathbf{y}} + c\left(z_{11} + \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O V
$\mathbf{B_{59}}$	=	$2x_{11}\,\mathbf{a}_1 + x_{11}\,\mathbf{a}_2 - z_{11}\,\mathbf{a}_3$	=	$\frac{3}{2}ax_{11}\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_{11}\,\hat{\mathbf{y}} - cz_{11}\,\hat{\mathbf{z}}$	(12k)	O V
$\mathbf{B_{60}}$	=	$-x_{11}\,\mathbf{a}_1 - 2x_{11}\,\mathbf{a}_2 - z_{11}\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_{11}\,\hat{\mathbf{x}} - \frac{\sqrt{3}}{2}ax_{11}\,\hat{\mathbf{y}} - cz_{11}\,\hat{\mathbf{z}}$	(12k)	O V
$\mathbf{B_{61}}$	=	$-x_{11}\,\mathbf{a}_1 + x_{11}\,\mathbf{a}_2 - z_{11}\,\mathbf{a}_3$	=	$\sqrt{3}ax_{11}\,\hat{\mathbf{y}} - cz_{11}\,\hat{\mathbf{z}}$	(12k)	O V
$\mathbf{B_{62}}$	=	$-2x_{11}\,\mathbf{a}_1 - x_{11}\,\mathbf{a}_2 - \left(z_{11} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\frac{3}{2}ax_{11}\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_{11}\,\hat{\mathbf{y}} - c\left(z_{11} - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O V
$\mathbf{B_{63}}$	=	$x_{11}\,\mathbf{a}_1 + 2x_{11}\,\mathbf{a}_2 - \left(z_{11} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{3}{2}ax_{11}\,\hat{\mathbf{x}} + \frac{\sqrt{3}}{2}ax_{11}\,\hat{\mathbf{y}} - c\left(z_{11} - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O V
$\mathbf{B_{64}}$	=	$x_{11}\,\mathbf{a}_1 - x_{11}\,\mathbf{a}_2 - \left(z_{11} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\sqrt{3}ax_{11}\,\hat{\mathbf{y}} - c\left(z_{11} - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(12k)	O V

References

[1] R. Gerber, Z. Šimša, and L. Jenšovský, *A note on the magnetoplumbite crystal structure*, Czech. J. Phys. **44**, 937–940 (1994), doi:10.1007/BF01715487.

[2] D. A. Vinnik, E. A. Trofimov, V. E. Zhivulin, O. V. Zaitseva, S. A. Gudkova, A. Y. Starikov, D. A. Zherebtsov, A. A. Kirsanova, M. Häßner, and R. Niewa, *High-entropy oxide phases with magnetoplumbite structure*, Ceram. Int. **45**, 12942–12948 (2019), doi:10.1016/j.ceramint.2019.03.221.

[3] V. Adelskoeld, *X-ray studies on magneto plumbite $PbO(Fe_2O_3)_6$ and other substances resembling β-alumina $Na_2O(Al_2O_3)_{11}$*, Arkiv för Kemi, Mineralogi och Geologi **12**, 1–9 (1938).

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