$Li_{17}Pb_4$ Structure: A17B4_cF420_216_a6efg4h_2efg-001

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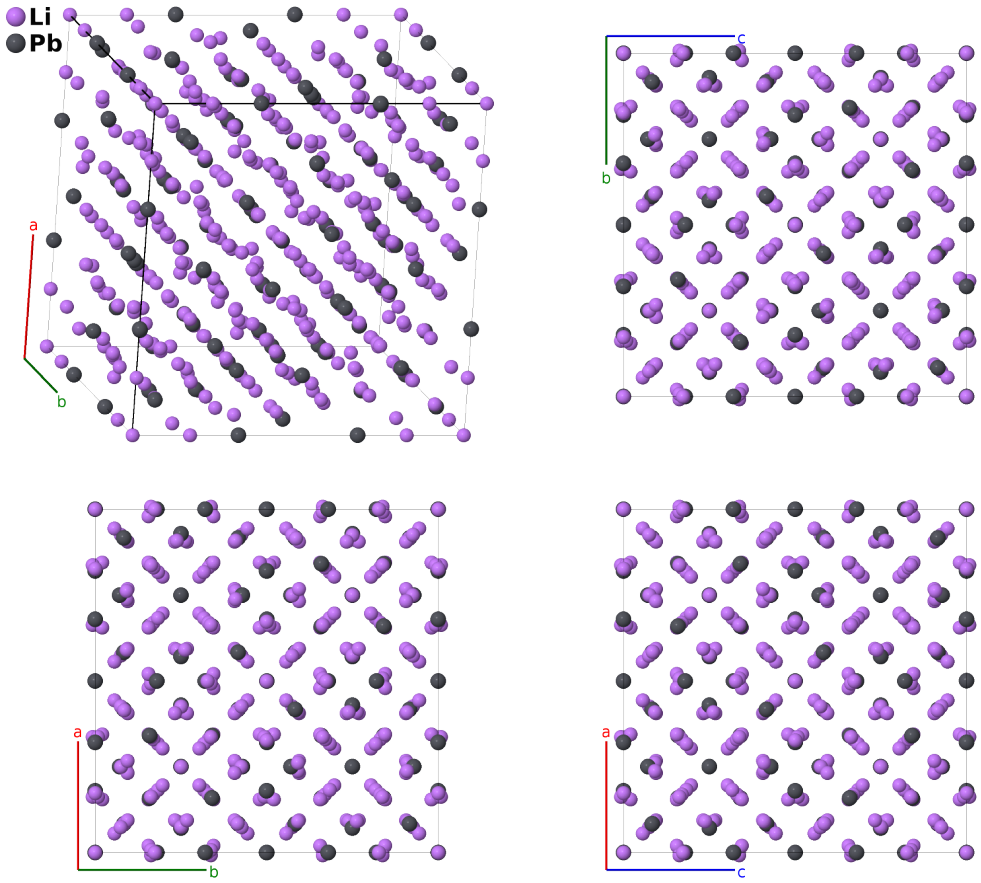
https://aflow.org/p/4E2L

https://aflow.org/p/A17B4_cF420_216_a6efg4h_2efg-001



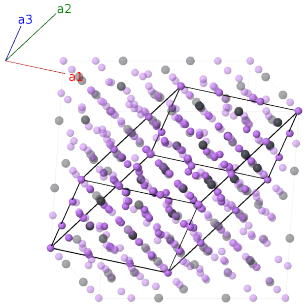
Prototype	$Li_{17}Pb_4$
AFLOW prototype label	A17B4_cF420_216_a6efg4h_2efg-001
ICSD	107216
Pearson symbol	cF420
Space group number	216
Space group symbol	$F\bar{4}3m$
AFLOW prototype command	`aflow --proto=A17B4_cF420_216_a6efg4h_2efg-001 --params=`$a, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, x_{10}, x_{11}, x_{12}, x_{13}, x_{14}, z_{14}, x_{15}, z_{15}, x_{16}, z_{16}, x_{17}, z_{17}$

Other compounds with this structure
$Li_{17}Ge_4$, $Li_{17}Si_4$, $Li_{17}Sn_4$

- (Goward, 2001) propose this as a replacement for the $Li_{22}Si_5$ structure. The change in stoichiometry is accounted for by placing extra lithium atoms on the the (4c) site (1/41/41/4) and an additional (16e) site (xxx), adjusting the stoichiometry to fit $Li_{21}M_5$ or $Li_{22}M_5$ as needed. Phase diagrams quoted in (Villars, 2018) support this change.

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	(4a)	Li I
$\mathbf{B_2}$	=	$x_2\,\mathbf{a}_1 + x_2\,\mathbf{a}_2 + x_2\,\mathbf{a}_3$	=	$ax_2\,\hat{\mathbf{x}} + ax_2\,\hat{\mathbf{y}} + ax_2\,\hat{\mathbf{z}}$	(16e)	Li II
$\mathbf{B_3}$	=	$x_2\,\mathbf{a}_1 + x_2\,\mathbf{a}_2 - 3x_2\,\mathbf{a}_3$	=	$-ax_2\,\hat{\mathbf{x}} - ax_2\,\hat{\mathbf{y}} + ax_2\,\hat{\mathbf{z}}$	(16e)	Li II
$\mathbf{B_4}$	=	$x_2\,\mathbf{a}_1 - 3x_2\,\mathbf{a}_2 + x_2\,\mathbf{a}_3$	=	$-ax_2\,\hat{\mathbf{x}} + ax_2\,\hat{\mathbf{y}} - ax_2\,\hat{\mathbf{z}}$	(16e)	Li II
$\mathbf{B_5}$	=	$-3x_2\,\mathbf{a}_1 + x_2\,\mathbf{a}_2 + x_2\,\mathbf{a}_3$	=	$ax_2\,\hat{\mathbf{x}} - ax_2\,\hat{\mathbf{y}} - ax_2\,\hat{\mathbf{z}}$	(16e)	Li II
$\mathbf{B_6}$	=	$x_3\,\mathbf{a}_1 + x_3\,\mathbf{a}_2 + x_3\,\mathbf{a}_3$	=	$ax_3\,\hat{\mathbf{x}} + ax_3\,\hat{\mathbf{y}} + ax_3\,\hat{\mathbf{z}}$	(16e)	Li III
$\mathbf{B_7}$	=	$x_3\,\mathbf{a}_1 + x_3\,\mathbf{a}_2 - 3x_3\,\mathbf{a}_3$	=	$-ax_3\,\hat{\mathbf{x}} - ax_3\,\hat{\mathbf{y}} + ax_3\,\hat{\mathbf{z}}$	(16e)	Li III
$\mathbf{B_8}$	=	$x_3\,\mathbf{a}_1 - 3x_3\,\mathbf{a}_2 + x_3\,\mathbf{a}_3$	=	$-ax_3\,\hat{\mathbf{x}} + ax_3\,\hat{\mathbf{y}} - ax_3\,\hat{\mathbf{z}}$	(16e)	Li III
$\mathbf{B_9}$	=	$-3x_3\,\mathbf{a}_1 + x_3\,\mathbf{a}_2 + x_3\,\mathbf{a}_3$	=	$ax_3\,\hat{\mathbf{x}} - ax_3\,\hat{\mathbf{y}} - ax_3\,\hat{\mathbf{z}}$	(16e)	Li III
$\mathbf{B_{10}}$	=	$x_4\,\mathbf{a}_1 + x_4\,\mathbf{a}_2 + x_4\,\mathbf{a}_3$	=	$ax_4\,\hat{\mathbf{x}} + ax_4\,\hat{\mathbf{y}} + ax_4\,\hat{\mathbf{z}}$	(16e)	Li IV
$\mathbf{B_{11}}$	=	$x_4\,\mathbf{a}_1 + x_4\,\mathbf{a}_2 - 3x_4\,\mathbf{a}_3$	=	$-ax_4\,\hat{\mathbf{x}} - ax_4\,\hat{\mathbf{y}} + ax_4\,\hat{\mathbf{z}}$	(16e)	Li IV
$\mathbf{B_{12}}$	=	$x_4\,\mathbf{a}_1 - 3x_4\,\mathbf{a}_2 + x_4\,\mathbf{a}_3$	=	$-ax_4\,\hat{\mathbf{x}} + ax_4\,\hat{\mathbf{y}} - ax_4\,\hat{\mathbf{z}}$	(16e)	Li IV
$\mathbf{B_{13}}$	=	$-3x_4\,\mathbf{a}_1 + x_4\,\mathbf{a}_2 + x_4\,\mathbf{a}_3$	=	$ax_4\,\hat{\mathbf{x}} - ax_4\,\hat{\mathbf{y}} - ax_4\,\hat{\mathbf{z}}$	(16e)	Li IV
$\mathbf{B_{14}}$	=	$x_5\,\mathbf{a}_1 + x_5\,\mathbf{a}_2 + x_5\,\mathbf{a}_3$	=	$ax_5\,\hat{\mathbf{x}} + ax_5\,\hat{\mathbf{y}} + ax_5\,\hat{\mathbf{z}}$	(16e)	Li V
$\mathbf{B_{15}}$	=	$x_5\,\mathbf{a}_1 + x_5\,\mathbf{a}_2 - 3x_5\,\mathbf{a}_3$	=	$-ax_5\,\hat{\mathbf{x}} - ax_5\,\hat{\mathbf{y}} + ax_5\,\hat{\mathbf{z}}$	(16e)	Li V
$\mathbf{B_{16}}$	=	$x_5\,\mathbf{a}_1 - 3x_5\,\mathbf{a}_2 + x_5\,\mathbf{a}_3$	=	$-ax_5\,\hat{\mathbf{x}} + ax_5\,\hat{\mathbf{y}} - ax_5\,\hat{\mathbf{z}}$	(16e)	Li V
$\mathbf{B_{17}}$	=	$-3x_5\,\mathbf{a}_1 + x_5\,\mathbf{a}_2 + x_5\,\mathbf{a}_3$	=	$ax_5\,\hat{\mathbf{x}} - ax_5\,\hat{\mathbf{y}} - ax_5\,\hat{\mathbf{z}}$	(16e)	Li V
$\mathbf{B_{18}}$	=	$x_6\,\mathbf{a}_1 + x_6\,\mathbf{a}_2 + x_6\,\mathbf{a}_3$	=	$ax_6\,\hat{\mathbf{x}} + ax_6\,\hat{\mathbf{y}} + ax_6\,\hat{\mathbf{z}}$	(16e)	Li VI
$\mathbf{B_{19}}$	=	$x_6\,\mathbf{a}_1 + x_6\,\mathbf{a}_2 - 3x_6\,\mathbf{a}_3$	=	$-ax_6\,\hat{\mathbf{x}} - ax_6\,\hat{\mathbf{y}} + ax_6\,\hat{\mathbf{z}}$	(16e)	Li VI
$\mathbf{B_{20}}$	=	$x_6\,\mathbf{a}_1 - 3x_6\,\mathbf{a}_2 + x_6\,\mathbf{a}_3$	=	$-ax_6\,\hat{\mathbf{x}} + ax_6\,\hat{\mathbf{y}} - ax_6\,\hat{\mathbf{z}}$	(16e)	Li VI
$\mathbf{B_{21}}$	=	$-3x_6\,\mathbf{a}_1 + x_6\,\mathbf{a}_2 + x_6\,\mathbf{a}_3$	=	$ax_6\,\hat{\mathbf{x}} - ax_6\,\hat{\mathbf{y}} - ax_6\,\hat{\mathbf{z}}$	(16e)	Li VI
$\mathbf{B_{22}}$	=	$x_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 + x_7\,\mathbf{a}_3$	=	$ax_7\,\hat{\mathbf{x}} + ax_7\,\hat{\mathbf{y}} + ax_7\,\hat{\mathbf{z}}$	(16e)	Li VII
$\mathbf{B_{23}}$	=	$x_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 - 3x_7\,\mathbf{a}_3$	=	$-ax_7\,\hat{\mathbf{x}} - ax_7\,\hat{\mathbf{y}} + ax_7\,\hat{\mathbf{z}}$	(16e)	Li VII
$\mathbf{B_{24}}$	=	$x_7\,\mathbf{a}_1 - 3x_7\,\mathbf{a}_2 + x_7\,\mathbf{a}_3$	=	$-ax_7\,\hat{\mathbf{x}} + ax_7\,\hat{\mathbf{y}} - ax_7\,\hat{\mathbf{z}}$	(16e)	Li VII
$\mathbf{B_{25}}$	=	$-3x_7\,\mathbf{a}_1 + x_7\,\mathbf{a}_2 + x_7\,\mathbf{a}_3$	=	$ax_7\,\hat{\mathbf{x}} - ax_7\,\hat{\mathbf{y}} - ax_7\,\hat{\mathbf{z}}$	(16e)	Li VII
$\mathbf{B_{26}}$	=	$x_8\,\mathbf{a}_1 + x_8\,\mathbf{a}_2 + x_8\,\mathbf{a}_3$	=	$ax_8\,\hat{\mathbf{x}} + ax_8\,\hat{\mathbf{y}} + ax_8\,\hat{\mathbf{z}}$	(16e)	Pb I

$\mathbf{B_{27}}$	=	$x_8\,\mathbf{a}_1 + x_8\,\mathbf{a}_2 - 3x_8\,\mathbf{a}_3$	=	$-ax_8\,\hat{\mathbf{x}} - ax_8\,\hat{\mathbf{y}} + ax_8\,\hat{\mathbf{z}}$	(16e)	Pb I
$\mathbf{B_{28}}$	=	$x_8\,\mathbf{a}_1 - 3x_8\,\mathbf{a}_2 + x_8\,\mathbf{a}_3$	=	$-ax_8\,\hat{\mathbf{x}} + ax_8\,\hat{\mathbf{y}} - ax_8\,\hat{\mathbf{z}}$	(16e)	Pb I
$\mathbf{B_{29}}$	=	$-3x_8\,\mathbf{a}_1 + x_8\,\mathbf{a}_2 + x_8\,\mathbf{a}_3$	=	$ax_8\,\hat{\mathbf{x}} - ax_8\,\hat{\mathbf{y}} - ax_8\,\hat{\mathbf{z}}$	(16e)	Pb I
$\mathbf{B_{30}}$	=	$x_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 + x_9\,\mathbf{a}_3$	=	$ax_9\,\hat{\mathbf{x}} + ax_9\,\hat{\mathbf{y}} + ax_9\,\hat{\mathbf{z}}$	(16e)	Pb II
$\mathbf{B_{31}}$	=	$x_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 - 3x_9\,\mathbf{a}_3$	=	$-ax_9\,\hat{\mathbf{x}} - ax_9\,\hat{\mathbf{y}} + ax_9\,\hat{\mathbf{z}}$	(16e)	Pb II
$\mathbf{B_{32}}$	=	$x_9\,\mathbf{a}_1 - 3x_9\,\mathbf{a}_2 + x_9\,\mathbf{a}_3$	=	$-ax_9\,\hat{\mathbf{x}} + ax_9\,\hat{\mathbf{y}} - ax_9\,\hat{\mathbf{z}}$	(16e)	Pb II
$\mathbf{B_{33}}$	=	$-3x_9\,\mathbf{a}_1 + x_9\,\mathbf{a}_2 + x_9\,\mathbf{a}_3$	=	$ax_9\,\hat{\mathbf{x}} - ax_9\,\hat{\mathbf{y}} - ax_9\,\hat{\mathbf{z}}$	(16e)	Pb II
$\mathbf{B_{34}}$	=	$-x_{10}\,\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 + x_{10}\,\mathbf{a}_3$	=	$ax_{10}\,\hat{\mathbf{x}}$	(24f)	Li VIII
$\mathbf{B_{35}}$	=	$x_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 - x_{10}\,\mathbf{a}_3$	=	$-ax_{10}\,\hat{\mathbf{x}}$	(24f)	Li VIII
$\mathbf{B_{36}}$	=	$x_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 + x_{10}\,\mathbf{a}_3$	=	$ax_{10}\,\hat{\mathbf{y}}$	(24f)	Li VIII
$\mathbf{B_{37}}$	=	$-x_{10}\,\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 - x_{10}\,\mathbf{a}_3$	=	$-ax_{10}\,\hat{\mathbf{y}}$	(24f)	Li VIII
$\mathbf{B_{38}}$	=	$x_{10}\,\mathbf{a}_1 + x_{10}\,\mathbf{a}_2 - x_{10}\,\mathbf{a}_3$	=	$ax_{10}\,\hat{\mathbf{z}}$	(24f)	Li VIII
$\mathbf{B_{39}}$	=	$-x_{10}\,\mathbf{a}_1 - x_{10}\,\mathbf{a}_2 + x_{10}\,\mathbf{a}_3$	=	$-ax_{10}\,\hat{\mathbf{z}}$	(24f)	Li VIII
$\mathbf{B_{40}}$	=	$-x_{11}\,\mathbf{a}_1 + x_{11}\,\mathbf{a}_2 + x_{11}\,\mathbf{a}_3$	=	$ax_{11}\,\hat{\mathbf{x}}$	(24f)	Pb III
$\mathbf{B_{41}}$	=	$x_{11}\,\mathbf{a}_1 - x_{11}\,\mathbf{a}_2 - x_{11}\,\mathbf{a}_3$	=	$-ax_{11}\,\hat{\mathbf{x}}$	(24f)	Pb III
$\mathbf{B_{42}}$	=	$x_{11}\,\mathbf{a}_1 - x_{11}\,\mathbf{a}_2 + x_{11}\,\mathbf{a}_3$	=	$ax_{11}\,\hat{\mathbf{y}}$	(24f)	Pb III
$\mathbf{B_{43}}$	=	$-x_{11}\,\mathbf{a}_1 + x_{11}\,\mathbf{a}_2 - x_{11}\,\mathbf{a}_3$	=	$-ax_{11}\,\hat{\mathbf{y}}$	(24f)	Pb III
$\mathbf{B_{44}}$	=	$x_{11}\,\mathbf{a}_1 + x_{11}\,\mathbf{a}_2 - x_{11}\,\mathbf{a}_3$	=	$ax_{11}\,\hat{\mathbf{z}}$	(24f)	Pb III
$\mathbf{B_{45}}$	=	$-x_{11}\,\mathbf{a}_1 - x_{11}\,\mathbf{a}_2 + x_{11}\,\mathbf{a}_3$	=	$-ax_{11}\,\hat{\mathbf{z}}$	(24f)	Pb III
$\mathbf{B_{46}}$	=	$-\left(x_{12} - \frac{1}{2}\right)\,\mathbf{a}_1 + x_{12}\,\mathbf{a}_2 + x_{12}\,\mathbf{a}_3$	=	$ax_{12}\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Li IX
$\mathbf{B_{47}}$	=	$x_{12}\,\mathbf{a}_1 - \left(x_{12} - \frac{1}{2}\right)\,\mathbf{a}_2 - \left(x_{12} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-a\left(x_{12} - \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Li IX
$\mathbf{B_{48}}$	=	$x_{12}\,\mathbf{a}_1 - \left(x_{12} - \frac{1}{2}\right)\,\mathbf{a}_2 + x_{12}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + ax_{12}\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Li IX
$\mathbf{B_{49}}$	=	$-\left(x_{12} - \frac{1}{2}\right)\,\mathbf{a}_1 + x_{12}\,\mathbf{a}_2 - \left(x_{12} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} - a\left(x_{12} - \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Li IX
$\mathbf{B_{50}}$	=	$x_{12}\,\mathbf{a}_1 + x_{12}\,\mathbf{a}_2 - \left(x_{12} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + ax_{12}\,\hat{\mathbf{z}}$	(24g)	Li IX
$\mathbf{B_{51}}$	=	$-\left(x_{12} - \frac{1}{2}\right)\,\mathbf{a}_1 - \left(x_{12} - \frac{1}{2}\right)\,\mathbf{a}_2 + x_{12}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} - a\left(x_{12} - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(24g)	Li IX
$\mathbf{B_{52}}$	=	$-\left(x_{13} - \frac{1}{2}\right)\,\mathbf{a}_1 + x_{13}\,\mathbf{a}_2 + x_{13}\,\mathbf{a}_3$	=	$ax_{13}\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Pb IV
$\mathbf{B_{53}}$	=	$x_{13}\,\mathbf{a}_1 - \left(x_{13} - \frac{1}{2}\right)\,\mathbf{a}_2 - \left(x_{13} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-a\left(x_{13} - \frac{1}{2}\right)\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Pb IV
$\mathbf{B_{54}}$	=	$x_{13}\,\mathbf{a}_1 - \left(x_{13} - \frac{1}{2}\right)\,\mathbf{a}_2 + x_{13}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + ax_{13}\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Pb IV
$\mathbf{B_{55}}$	=	$-\left(x_{13} - \frac{1}{2}\right)\,\mathbf{a}_1 + x_{13}\,\mathbf{a}_2 - \left(x_{13} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} - a\left(x_{13} - \frac{1}{2}\right)\,\hat{\mathbf{y}} + \frac{1}{4}a\,\hat{\mathbf{z}}$	(24g)	Pb IV
$\mathbf{B_{56}}$	=	$x_{13}\,\mathbf{a}_1 + x_{13}\,\mathbf{a}_2 - \left(x_{13} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} + ax_{13}\,\hat{\mathbf{z}}$	(24g)	Pb IV
$\mathbf{B_{57}}$	=	$-\left(x_{13} - \frac{1}{2}\right)\,\mathbf{a}_1 - \left(x_{13} - \frac{1}{2}\right)\,\mathbf{a}_2 + x_{13}\,\mathbf{a}_3$	=	$\frac{1}{4}a\,\hat{\mathbf{x}} + \frac{1}{4}a\,\hat{\mathbf{y}} - a\left(x_{13} - \frac{1}{2}\right)\,\hat{\mathbf{z}}$	(24g)	Pb IV
$\mathbf{B_{58}}$	=	$z_{14}\,\mathbf{a}_1 + z_{14}\,\mathbf{a}_2 + (2x_{14} - z_{14})\,\mathbf{a}_3$	=	$ax_{14}\,\hat{\mathbf{x}} + ax_{14}\,\hat{\mathbf{y}} + az_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{59}}$	=	$z_{14}\,\mathbf{a}_1 + z_{14}\,\mathbf{a}_2 - (2x_{14} + z_{14})\,\mathbf{a}_3$	=	$-ax_{14}\,\hat{\mathbf{x}} - ax_{14}\,\hat{\mathbf{y}} + az_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{60}}$	=	$(2x_{14} - z_{14})\,\mathbf{a}_1 - (2x_{14} + z_{14})\,\mathbf{a}_2 + z_{14}\,\mathbf{a}_3$	=	$-ax_{14}\,\hat{\mathbf{x}} + ax_{14}\,\hat{\mathbf{y}} - az_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{61}}$	=	$-(2x_{14} + z_{14})\,\mathbf{a}_1 + (2x_{14} - z_{14})\,\mathbf{a}_2 + z_{14}\,\mathbf{a}_3$	=	$ax_{14}\,\hat{\mathbf{x}} - ax_{14}\,\hat{\mathbf{y}} - az_{14}\,\hat{\mathbf{z}}$	(48h)	Li X

$\mathbf{B_{62}}$	=	$(2x_{14}-z_{14})\,\mathbf{a}_1+z_{14}\,\mathbf{a}_2+z_{14}\,\mathbf{a}_3$	=	$az_{14}\,\hat{\mathbf{x}}+ax_{14}\,\hat{\mathbf{y}}+ax_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{63}}$	=	$-(2x_{14}+z_{14})\,\mathbf{a}_1+z_{14}\,\mathbf{a}_2+z_{14}\,\mathbf{a}_3$	=	$az_{14}\,\hat{\mathbf{x}}-ax_{14}\,\hat{\mathbf{y}}-ax_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{64}}$	=	$z_{14}\,\mathbf{a}_1+(2x_{14}-z_{14})\,\mathbf{a}_2-(2x_{14}+z_{14})\,\mathbf{a}_3$	=	$-az_{14}\,\hat{\mathbf{x}}-ax_{14}\,\hat{\mathbf{y}}+ax_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{65}}$	=	$z_{14}\,\mathbf{a}_1-(2x_{14}+z_{14})\,\mathbf{a}_2+(2x_{14}-z_{14})\,\mathbf{a}_3$	=	$-az_{14}\,\hat{\mathbf{x}}+ax_{14}\,\hat{\mathbf{y}}-ax_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{66}}$	=	$z_{14}\,\mathbf{a}_1+(2x_{14}-z_{14})\,\mathbf{a}_2+z_{14}\,\mathbf{a}_3$	=	$ax_{14}\,\hat{\mathbf{x}}+az_{14}\,\hat{\mathbf{y}}+ax_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{67}}$	=	$z_{14}\,\mathbf{a}_1-(2x_{14}+z_{14})\,\mathbf{a}_2+z_{14}\,\mathbf{a}_3$	=	$-ax_{14}\,\hat{\mathbf{x}}+az_{14}\,\hat{\mathbf{y}}-ax_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{68}}$	=	$-(2x_{14}+z_{14})\,\mathbf{a}_1+z_{14}\,\mathbf{a}_2+(2x_{14}-z_{14})\,\mathbf{a}_3$	=	$ax_{14}\,\hat{\mathbf{x}}-az_{14}\,\hat{\mathbf{y}}-ax_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{69}}$	=	$(2x_{14}-z_{14})\,\mathbf{a}_1+z_{14}\,\mathbf{a}_2-(2x_{14}+z_{14})\,\mathbf{a}_3$	=	$-ax_{14}\,\hat{\mathbf{x}}-az_{14}\,\hat{\mathbf{y}}+ax_{14}\,\hat{\mathbf{z}}$	(48h)	Li X
$\mathbf{B_{70}}$	=	$z_{15}\,\mathbf{a}_1+z_{15}\,\mathbf{a}_2+(2x_{15}-z_{15})\,\mathbf{a}_3$	=	$ax_{15}\,\hat{\mathbf{x}}+ax_{15}\,\hat{\mathbf{y}}+az_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{71}}$	=	$z_{15}\,\mathbf{a}_1+z_{15}\,\mathbf{a}_2-(2x_{15}+z_{15})\,\mathbf{a}_3$	=	$-ax_{15}\,\hat{\mathbf{x}}-ax_{15}\,\hat{\mathbf{y}}+az_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{72}}$	=	$(2x_{15}-z_{15})\,\mathbf{a}_1-(2x_{15}+z_{15})\,\mathbf{a}_2+z_{15}\,\mathbf{a}_3$	=	$-ax_{15}\,\hat{\mathbf{x}}+ax_{15}\,\hat{\mathbf{y}}-az_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{73}}$	=	$-(2x_{15}+z_{15})\,\mathbf{a}_1+(2x_{15}-z_{15})\,\mathbf{a}_2+z_{15}\,\mathbf{a}_3$	=	$ax_{15}\,\hat{\mathbf{x}}-ax_{15}\,\hat{\mathbf{y}}-az_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{74}}$	=	$(2x_{15}-z_{15})\,\mathbf{a}_1+z_{15}\,\mathbf{a}_2+z_{15}\,\mathbf{a}_3$	=	$az_{15}\,\hat{\mathbf{x}}+ax_{15}\,\hat{\mathbf{y}}+ax_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{75}}$	=	$-(2x_{15}+z_{15})\,\mathbf{a}_1+z_{15}\,\mathbf{a}_2+z_{15}\,\mathbf{a}_3$	=	$az_{15}\,\hat{\mathbf{x}}-ax_{15}\,\hat{\mathbf{y}}-ax_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{76}}$	=	$z_{15}\,\mathbf{a}_1+(2x_{15}-z_{15})\,\mathbf{a}_2-(2x_{15}+z_{15})\,\mathbf{a}_3$	=	$-az_{15}\,\hat{\mathbf{x}}-ax_{15}\,\hat{\mathbf{y}}+ax_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{77}}$	=	$z_{15}\,\mathbf{a}_1-(2x_{15}+z_{15})\,\mathbf{a}_2+(2x_{15}-z_{15})\,\mathbf{a}_3$	=	$-az_{15}\,\hat{\mathbf{x}}+ax_{15}\,\hat{\mathbf{y}}-ax_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{78}}$	=	$z_{15}\,\mathbf{a}_1+(2x_{15}-z_{15})\,\mathbf{a}_2+z_{15}\,\mathbf{a}_3$	=	$ax_{15}\,\hat{\mathbf{x}}+az_{15}\,\hat{\mathbf{y}}+ax_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{79}}$	=	$z_{15}\,\mathbf{a}_1-(2x_{15}+z_{15})\,\mathbf{a}_2+z_{15}\,\mathbf{a}_3$	=	$-ax_{15}\,\hat{\mathbf{x}}+az_{15}\,\hat{\mathbf{y}}-ax_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{80}}$	=	$-(2x_{15}+z_{15})\,\mathbf{a}_1+z_{15}\,\mathbf{a}_2+(2x_{15}-z_{15})\,\mathbf{a}_3$	=	$ax_{15}\,\hat{\mathbf{x}}-az_{15}\,\hat{\mathbf{y}}-ax_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{81}}$	=	$(2x_{15}-z_{15})\,\mathbf{a}_1+z_{15}\,\mathbf{a}_2-(2x_{15}+z_{15})\,\mathbf{a}_3$	=	$-ax_{15}\,\hat{\mathbf{x}}-az_{15}\,\hat{\mathbf{y}}+ax_{15}\,\hat{\mathbf{z}}$	(48h)	Li XI
$\mathbf{B_{82}}$	=	$z_{16}\,\mathbf{a}_1+z_{16}\,\mathbf{a}_2+(2x_{16}-z_{16})\,\mathbf{a}_3$	=	$ax_{16}\,\hat{\mathbf{x}}+ax_{16}\,\hat{\mathbf{y}}+az_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{83}}$	=	$z_{16}\,\mathbf{a}_1+z_{16}\,\mathbf{a}_2-(2x_{16}+z_{16})\,\mathbf{a}_3$	=	$-ax_{16}\,\hat{\mathbf{x}}-ax_{16}\,\hat{\mathbf{y}}+az_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{84}}$	=	$(2x_{16}-z_{16})\,\mathbf{a}_1-(2x_{16}+z_{16})\,\mathbf{a}_2+z_{16}\,\mathbf{a}_3$	=	$-ax_{16}\,\hat{\mathbf{x}}+ax_{16}\,\hat{\mathbf{y}}-az_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{85}}$	=	$-(2x_{16}+z_{16})\,\mathbf{a}_1+(2x_{16}-z_{16})\,\mathbf{a}_2+z_{16}\,\mathbf{a}_3$	=	$ax_{16}\,\hat{\mathbf{x}}-ax_{16}\,\hat{\mathbf{y}}-az_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{86}}$	=	$(2x_{16}-z_{16})\,\mathbf{a}_1+z_{16}\,\mathbf{a}_2+z_{16}\,\mathbf{a}_3$	=	$az_{16}\,\hat{\mathbf{x}}+ax_{16}\,\hat{\mathbf{y}}+ax_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{87}}$	=	$-(2x_{16}+z_{16})\,\mathbf{a}_1+z_{16}\,\mathbf{a}_2+z_{16}\,\mathbf{a}_3$	=	$az_{16}\,\hat{\mathbf{x}}-ax_{16}\,\hat{\mathbf{y}}-ax_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{88}}$	=	$z_{16}\,\mathbf{a}_1+(2x_{16}-z_{16})\,\mathbf{a}_2-(2x_{16}+z_{16})\,\mathbf{a}_3$	=	$-az_{16}\,\hat{\mathbf{x}}-ax_{16}\,\hat{\mathbf{y}}+ax_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{89}}$	=	$z_{16}\,\mathbf{a}_1-(2x_{16}+z_{16})\,\mathbf{a}_2+(2x_{16}-z_{16})\,\mathbf{a}_3$	=	$-az_{16}\,\hat{\mathbf{x}}+ax_{16}\,\hat{\mathbf{y}}-ax_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{90}}$	=	$z_{16}\,\mathbf{a}_1+(2x_{16}-z_{16})\,\mathbf{a}_2+z_{16}\,\mathbf{a}_3$	=	$ax_{16}\,\hat{\mathbf{x}}+az_{16}\,\hat{\mathbf{y}}+ax_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{91}}$	=	$z_{16}\,\mathbf{a}_1-(2x_{16}+z_{16})\,\mathbf{a}_2+z_{16}\,\mathbf{a}_3$	=	$-ax_{16}\,\hat{\mathbf{x}}+az_{16}\,\hat{\mathbf{y}}-ax_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII

$\mathbf{B_{92}}$	=	$-(2x_{16}+z_{16})\,\mathbf{a}_1+z_{16}\,\mathbf{a}_2+(2x_{16}-z_{16})\,\mathbf{a}_3$	=	$ax_{16}\,\hat{\mathbf{x}}-az_{16}\,\hat{\mathbf{y}}-ax_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{93}}$	=	$(2x_{16}-z_{16})\,\mathbf{a}_1+z_{16}\,\mathbf{a}_2-(2x_{16}+z_{16})\,\mathbf{a}_3$	=	$-ax_{16}\,\hat{\mathbf{x}}-az_{16}\,\hat{\mathbf{y}}+ax_{16}\,\hat{\mathbf{z}}$	(48h)	Li XII
$\mathbf{B_{94}}$	=	$z_{17}\,\mathbf{a}_1+z_{17}\,\mathbf{a}_2+(2x_{17}-z_{17})\,\mathbf{a}_3$	=	$ax_{17}\,\hat{\mathbf{x}}+ax_{17}\,\hat{\mathbf{y}}+az_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{95}}$	=	$z_{17}\,\mathbf{a}_1+z_{17}\,\mathbf{a}_2-(2x_{17}+z_{17})\,\mathbf{a}_3$	=	$-ax_{17}\,\hat{\mathbf{x}}-ax_{17}\,\hat{\mathbf{y}}+az_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{96}}$	=	$(2x_{17}-z_{17})\,\mathbf{a}_1-(2x_{17}+z_{17})\,\mathbf{a}_2+z_{17}\,\mathbf{a}_3$	=	$-ax_{17}\,\hat{\mathbf{x}}+ax_{17}\,\hat{\mathbf{y}}-az_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{97}}$	=	$-(2x_{17}+z_{17})\,\mathbf{a}_1+(2x_{17}-z_{17})\,\mathbf{a}_2+z_{17}\,\mathbf{a}_3$	=	$ax_{17}\,\hat{\mathbf{x}}-ax_{17}\,\hat{\mathbf{y}}-az_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{98}}$	=	$(2x_{17}-z_{17})\,\mathbf{a}_1+z_{17}\,\mathbf{a}_2+z_{17}\,\mathbf{a}_3$	=	$az_{17}\,\hat{\mathbf{x}}+ax_{17}\,\hat{\mathbf{y}}+ax_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{99}}$	=	$-(2x_{17}+z_{17})\,\mathbf{a}_1+z_{17}\,\mathbf{a}_2+z_{17}\,\mathbf{a}_3$	=	$az_{17}\,\hat{\mathbf{x}}-ax_{17}\,\hat{\mathbf{y}}-ax_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{100}}$	=	$z_{17}\,\mathbf{a}_1+(2x_{17}-z_{17})\,\mathbf{a}_2-(2x_{17}+z_{17})\,\mathbf{a}_3$	=	$-az_{17}\,\hat{\mathbf{x}}-ax_{17}\,\hat{\mathbf{y}}+ax_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{101}}$	=	$z_{17}\,\mathbf{a}_1-(2x_{17}+z_{17})\,\mathbf{a}_2+(2x_{17}-z_{17})\,\mathbf{a}_3$	=	$-az_{17}\,\hat{\mathbf{x}}+ax_{17}\,\hat{\mathbf{y}}-ax_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{102}}$	=	$z_{17}\,\mathbf{a}_1+(2x_{17}-z_{17})\,\mathbf{a}_2+z_{17}\,\mathbf{a}_3$	=	$ax_{17}\,\hat{\mathbf{x}}+az_{17}\,\hat{\mathbf{y}}+ax_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{103}}$	=	$z_{17}\,\mathbf{a}_1-(2x_{17}+z_{17})\,\mathbf{a}_2+z_{17}\,\mathbf{a}_3$	=	$-ax_{17}\,\hat{\mathbf{x}}+az_{17}\,\hat{\mathbf{y}}-ax_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{104}}$	=	$-(2x_{17}+z_{17})\,\mathbf{a}_1+z_{17}\,\mathbf{a}_2+(2x_{17}-z_{17})\,\mathbf{a}_3$	=	$ax_{17}\,\hat{\mathbf{x}}-az_{17}\,\hat{\mathbf{y}}-ax_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII
$\mathbf{B_{105}}$	=	$(2x_{17}-z_{17})\,\mathbf{a}_1+z_{17}\,\mathbf{a}_2-(2x_{17}+z_{17})\,\mathbf{a}_3$	=	$-ax_{17}\,\hat{\mathbf{x}}-az_{17}\,\hat{\mathbf{y}}+ax_{17}\,\hat{\mathbf{z}}$	(48h)	Li XIII

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