$Rb_2Cu2(MoO_4)_3$ Structure: A2B3C12D2_mC152_15_2f_3f_12f_aef-001

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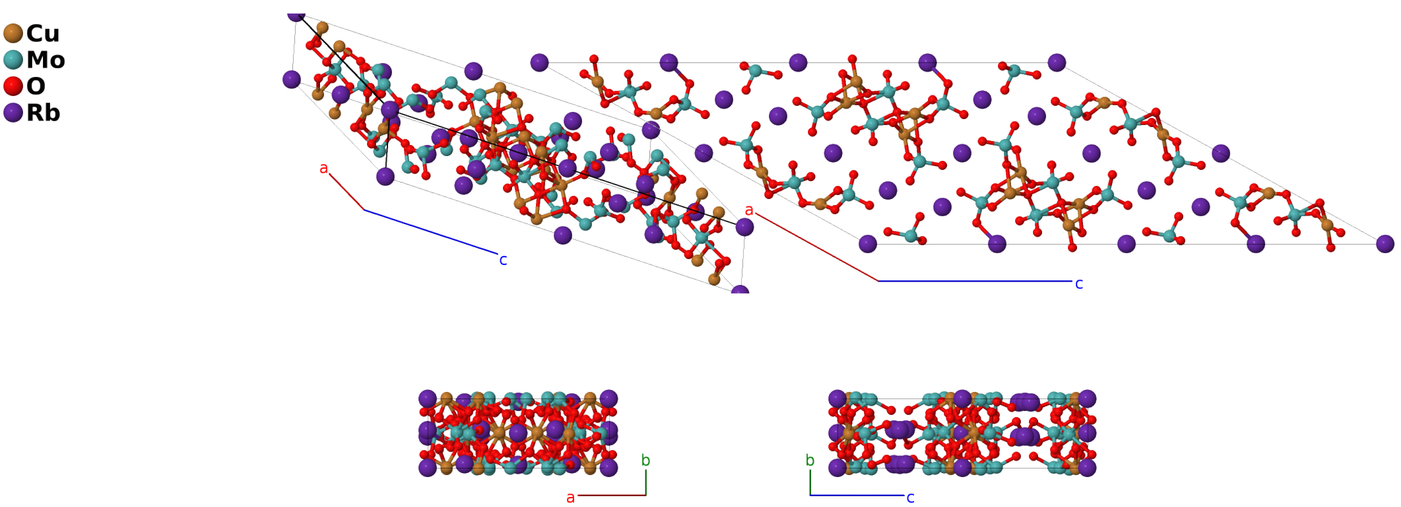
https://aflow.org/p/A42Z

https://aflow.org/p/A2B3C12D2_mC152_15_2f_3f_12f_aef-001



Prototype $Cu_2Mo_3O_{12}Rb_2$

AFLOW prototype label A2B3C12D2_mC152_15_2f_3f_12f_aef-001

ICSD 54023

Pearson symbol mC152

Space group number 15

Space group symbol $C2/c$

AFLOW prototype command `aflow --proto=A2B3C12D2_mC152_15_2f_3f_12f_aef-001`
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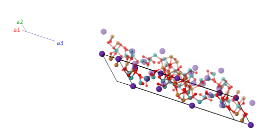
Other compounds with this structure

$Cs_2Cu2(MoO_4)_3$

Base-centered Monoclinic primitive vectors

$$\mathbf{a_1} = \frac{1}{2}a\,\hat{\mathbf{x}} - \frac{1}{2}b\,\hat{\mathbf{y}}$$
$$\mathbf{a_2} = \frac{1}{2}a\,\hat{\mathbf{x}} + \frac{1}{2}b\,\hat{\mathbf{y}}$$
$$\mathbf{a_3} = c\cos\beta\,\hat{\mathbf{x}} + c\sin\beta\,\hat{\mathbf{z}}$$



Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_1}$	=	0	=	0	(4a)	Rb I
$\mathbf{B_2}$	=	$\frac{1}{2}\,\mathbf{a}_3$	=	$\frac{1}{2}c\cos\beta\,\hat{\mathbf{x}} + \frac{1}{2}c\sin\beta\,\hat{\mathbf{z}}$	(4a)	Rb I
$\mathbf{B_3}$	=	$-y_2\,\mathbf{a}_1 + y_2\,\mathbf{a}_2 + \frac{1}{4}\,\mathbf{a}_3$	=	$\frac{1}{4}c\cos\beta\,\hat{\mathbf{x}} + by_2\,\hat{\mathbf{y}} + \frac{1}{4}c\sin\beta\,\hat{\mathbf{z}}$	(4e)	Rb II
$\mathbf{B_4}$	=	$y_2\,\mathbf{a}_1 - y_2\,\mathbf{a}_2 + \frac{3}{4}\,\mathbf{a}_3$	=	$\frac{3}{4}c\cos\beta\,\hat{\mathbf{x}} - by_2\,\hat{\mathbf{y}} + \frac{3}{4}c\sin\beta\,\hat{\mathbf{z}}$	(4e)	Rb II
$\mathbf{B_5}$	=	$(x_3 - y_3)\,\mathbf{a}_1 + (x_3 + y_3)\,\mathbf{a}_2 + z_3\,\mathbf{a}_3$	=	$(ax_3 + cz_3\cos\beta)\,\hat{\mathbf{x}} + by_3\,\hat{\mathbf{y}} + cz_3\sin\beta\,\hat{\mathbf{z}}$	(8f)	Cu I
$\mathbf{B_6}$	=	$-(x_3 + y_3)\,\mathbf{a}_1 - (x_3 - y_3)\,\mathbf{a}_2 - \left(z_3 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_3 + c\left(z_3 - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_3\,\hat{\mathbf{y}} - c\left(z_3 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	Cu I
$\mathbf{B_7}$	=	$-(x_3 - y_3)\,\mathbf{a}_1 - (x_3 + y_3)\,\mathbf{a}_2 - z_3\,\mathbf{a}_3$	=	$-(ax_3 + cz_3\cos\beta)\,\hat{\mathbf{x}} - by_3\,\hat{\mathbf{y}} - cz_3\sin\beta\,\hat{\mathbf{z}}$	(8f)	Cu I
$\mathbf{B_8}$	=	$(x_3 + y_3)\,\mathbf{a}_1 + (x_3 - y_3)\,\mathbf{a}_2 + \left(z_3 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_3 + c\left(z_3 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_3\,\hat{\mathbf{y}} + c\left(z_3 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	Cu I
$\mathbf{B_9}$	=	$(x_4 - y_4)\,\mathbf{a}_1 + (x_4 + y_4)\,\mathbf{a}_2 + z_4\,\mathbf{a}_3$	=	$(ax_4 + cz_4\cos\beta)\,\hat{\mathbf{x}} + by_4\,\hat{\mathbf{y}} + cz_4\sin\beta\,\hat{\mathbf{z}}$	(8f)	Cu II
$\mathbf{B_{10}}$	=	$-(x_4 + y_4)\,\mathbf{a}_1 - (x_4 - y_4)\,\mathbf{a}_2 - \left(z_4 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_4 + c\left(z_4 - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_4\,\hat{\mathbf{y}} - c\left(z_4 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	Cu II
$\mathbf{B_{11}}$	=	$-(x_4 - y_4)\,\mathbf{a}_1 - (x_4 + y_4)\,\mathbf{a}_2 - z_4\,\mathbf{a}_3$	=	$-(ax_4 + cz_4\cos\beta)\,\hat{\mathbf{x}} - by_4\,\hat{\mathbf{y}} - cz_4\sin\beta\,\hat{\mathbf{z}}$	(8f)	Cu II
$\mathbf{B_{12}}$	=	$(x_4 + y_4)\,\mathbf{a}_1 + (x_4 - y_4)\,\mathbf{a}_2 + \left(z_4 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_4 + c\left(z_4 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_4\,\hat{\mathbf{y}} + c\left(z_4 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	Cu II
$\mathbf{B_{13}}$	=	$(x_5 - y_5)\,\mathbf{a}_1 + (x_5 + y_5)\,\mathbf{a}_2 + z_5\,\mathbf{a}_3$	=	$(ax_5 + cz_5\cos\beta)\,\hat{\mathbf{x}} + by_5\,\hat{\mathbf{y}} + cz_5\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo I
$\mathbf{B_{14}}$	=	$-(x_5 + y_5)\,\mathbf{a}_1 - (x_5 - y_5)\,\mathbf{a}_2 - \left(z_5 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_5 + c\left(z_5 - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_5\,\hat{\mathbf{y}} - c\left(z_5 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo I
$\mathbf{B_{15}}$	=	$-(x_5 - y_5)\,\mathbf{a}_1 - (x_5 + y_5)\,\mathbf{a}_2 - z_5\,\mathbf{a}_3$	=	$-(ax_5 + cz_5\cos\beta)\,\hat{\mathbf{x}} - by_5\,\hat{\mathbf{y}} - cz_5\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo I
$\mathbf{B_{16}}$	=	$(x_5 + y_5)\,\mathbf{a}_1 + (x_5 - y_5)\,\mathbf{a}_2 + \left(z_5 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_5 + c\left(z_5 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_5\,\hat{\mathbf{y}} + c\left(z_5 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo I
$\mathbf{B_{17}}$	=	$(x_6 - y_6)\,\mathbf{a}_1 + (x_6 + y_6)\,\mathbf{a}_2 + z_6\,\mathbf{a}_3$	=	$(ax_6 + cz_6\cos\beta)\,\hat{\mathbf{x}} + by_6\,\hat{\mathbf{y}} + cz_6\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo II
$\mathbf{B_{18}}$	=	$-(x_6 + y_6)\,\mathbf{a}_1 - (x_6 - y_6)\,\mathbf{a}_2 - \left(z_6 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_6 + c\left(z_6 - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_6\,\hat{\mathbf{y}} - c\left(z_6 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo II
$\mathbf{B_{19}}$	=	$-(x_6 - y_6)\,\mathbf{a}_1 - (x_6 + y_6)\,\mathbf{a}_2 - z_6\,\mathbf{a}_3$	=	$-(ax_6 + cz_6\cos\beta)\,\hat{\mathbf{x}} - by_6\,\hat{\mathbf{y}} - cz_6\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo II
$\mathbf{B_{20}}$	=	$(x_6 + y_6)\,\mathbf{a}_1 + (x_6 - y_6)\,\mathbf{a}_2 + \left(z_6 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_6 + c\left(z_6 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_6\,\hat{\mathbf{y}} + c\left(z_6 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo II
$\mathbf{B_{21}}$	=	$(x_7 - y_7)\,\mathbf{a}_1 + (x_7 + y_7)\,\mathbf{a}_2 + z_7\,\mathbf{a}_3$	=	$(ax_7 + cz_7\cos\beta)\,\hat{\mathbf{x}} + by_7\,\hat{\mathbf{y}} + cz_7\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo III
$\mathbf{B_{22}}$	=	$-(x_7 + y_7)\,\mathbf{a}_1 - (x_7 - y_7)\,\mathbf{a}_2 - \left(z_7 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_7 + c\left(z_7 - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_7\,\hat{\mathbf{y}} - c\left(z_7 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo III
$\mathbf{B_{23}}$	=	$-(x_7 - y_7)\,\mathbf{a}_1 - (x_7 + y_7)\,\mathbf{a}_2 - z_7\,\mathbf{a}_3$	=	$-(ax_7 + cz_7\cos\beta)\,\hat{\mathbf{x}} - by_7\,\hat{\mathbf{y}} - cz_7\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo III
$\mathbf{B_{24}}$	=	$(x_7 + y_7)\,\mathbf{a}_1 + (x_7 - y_7)\,\mathbf{a}_2 + \left(z_7 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_7 + c\left(z_7 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_7\,\hat{\mathbf{y}} + c\left(z_7 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	Mo III

$\mathbf{B_{25}}$	=	$(x_8 - y_8)\,\mathbf{a}_1 + (x_8 + y_8)\,\mathbf{a}_2 + z_8\,\mathbf{a}_3$	=	$(ax_8 + cz_8\cos\beta)\,\hat{\mathbf{x}} + by_8\,\hat{\mathbf{y}} + cz_8\sin\beta\,\hat{\mathbf{z}}$	(8f)	O I
$\mathbf{B_{26}}$	=	$-(x_8 + y_8)\,\mathbf{a}_1 - (x_8 - y_8)\,\mathbf{a}_2 - \left(z_8 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_8 + c\left(z_8 - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_8\,\hat{\mathbf{y}} - c\left(z_8 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O I
$\mathbf{B_{27}}$	=	$-(x_8 - y_8)\,\mathbf{a}_1 - (x_8 + y_8)\,\mathbf{a}_2 - z_8\,\mathbf{a}_3$	=	$-(ax_8 + cz_8\cos\beta)\,\hat{\mathbf{x}} - by_8\,\hat{\mathbf{y}} - cz_8\sin\beta\,\hat{\mathbf{z}}$	(8f)	O I
$\mathbf{B_{28}}$	=	$(x_8 + y_8)\,\mathbf{a}_1 + (x_8 - y_8)\,\mathbf{a}_2 + \left(z_8 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_8 + c\left(z_8 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_8\,\hat{\mathbf{y}} + c\left(z_8 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O I
$\mathbf{B_{29}}$	=	$(x_9 - y_9)\,\mathbf{a}_1 + (x_9 + y_9)\,\mathbf{a}_2 + z_9\,\mathbf{a}_3$	=	$(ax_9 + cz_9\cos\beta)\,\hat{\mathbf{x}} + by_9\,\hat{\mathbf{y}} + cz_9\sin\beta\,\hat{\mathbf{z}}$	(8f)	O II
$\mathbf{B_{30}}$	=	$-(x_9 + y_9)\,\mathbf{a}_1 - (x_9 - y_9)\,\mathbf{a}_2 - \left(z_9 - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_9 + c\left(z_9 - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_9\,\hat{\mathbf{y}} - c\left(z_9 - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O II
$\mathbf{B_{31}}$	=	$-(x_9 - y_9)\,\mathbf{a}_1 - (x_9 + y_9)\,\mathbf{a}_2 - z_9\,\mathbf{a}_3$	=	$-(ax_9 + cz_9\cos\beta)\,\hat{\mathbf{x}} - by_9\,\hat{\mathbf{y}} - cz_9\sin\beta\,\hat{\mathbf{z}}$	(8f)	O II
$\mathbf{B_{32}}$	=	$(x_9 + y_9)\,\mathbf{a}_1 + (x_9 - y_9)\,\mathbf{a}_2 + \left(z_9 + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_9 + c\left(z_9 + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_9\,\hat{\mathbf{y}} + c\left(z_9 + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O II
$\mathbf{B_{33}}$	=	$(x_{10} - y_{10})\,\mathbf{a}_1 + (x_{10} + y_{10})\,\mathbf{a}_2 + z_{10}\,\mathbf{a}_3$	=	$(ax_{10} + cz_{10}\cos\beta)\,\hat{\mathbf{x}} + by_{10}\,\hat{\mathbf{y}} + cz_{10}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O III
$\mathbf{B_{34}}$	=	$-(x_{10} + y_{10})\,\mathbf{a}_1 - (x_{10} - y_{10})\,\mathbf{a}_2 - \left(z_{10} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_{10} + c\left(z_{10} - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_{10}\,\hat{\mathbf{y}} - c\left(z_{10} - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O III
$\mathbf{B_{35}}$	=	$-(x_{10} - y_{10})\,\mathbf{a}_1 - (x_{10} + y_{10})\,\mathbf{a}_2 - z_{10}\,\mathbf{a}_3$	=	$-(ax_{10} + cz_{10}\cos\beta)\,\hat{\mathbf{x}} - by_{10}\,\hat{\mathbf{y}} - cz_{10}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O III
$\mathbf{B_{36}}$	=	$(x_{10} + y_{10})\,\mathbf{a}_1 + (x_{10} - y_{10})\,\mathbf{a}_2 + \left(z_{10} + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{10} + c\left(z_{10} + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{10}\,\hat{\mathbf{y}} + c\left(z_{10} + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O III
$\mathbf{B_{37}}$	=	$(x_{11} - y_{11})\,\mathbf{a}_1 + (x_{11} + y_{11})\,\mathbf{a}_2 + z_{11}\,\mathbf{a}_3$	=	$(ax_{11} + cz_{11}\cos\beta)\,\hat{\mathbf{x}} + by_{11}\,\hat{\mathbf{y}} + cz_{11}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O IV
$\mathbf{B_{38}}$	=	$-(x_{11} + y_{11})\,\mathbf{a}_1 - (x_{11} - y_{11})\,\mathbf{a}_2 - \left(z_{11} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_{11} + c\left(z_{11} - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_{11}\,\hat{\mathbf{y}} - c\left(z_{11} - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O IV
$\mathbf{B_{39}}$	=	$-(x_{11} - y_{11})\,\mathbf{a}_1 - (x_{11} + y_{11})\,\mathbf{a}_2 - z_{11}\,\mathbf{a}_3$	=	$-(ax_{11} + cz_{11}\cos\beta)\,\hat{\mathbf{x}} - by_{11}\,\hat{\mathbf{y}} - cz_{11}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O IV
$\mathbf{B_{40}}$	=	$(x_{11} + y_{11})\,\mathbf{a}_1 + (x_{11} - y_{11})\,\mathbf{a}_2 + \left(z_{11} + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{11} + c\left(z_{11} + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{11}\,\hat{\mathbf{y}} + c\left(z_{11} + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O IV
$\mathbf{B_{41}}$	=	$(x_{12} - y_{12})\,\mathbf{a}_1 + (x_{12} + y_{12})\,\mathbf{a}_2 + z_{12}\,\mathbf{a}_3$	=	$(ax_{12} + cz_{12}\cos\beta)\,\hat{\mathbf{x}} + by_{12}\,\hat{\mathbf{y}} + cz_{12}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O V
$\mathbf{B_{42}}$	=	$-(x_{12} + y_{12})\,\mathbf{a}_1 - (x_{12} - y_{12})\,\mathbf{a}_2 - \left(z_{12} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_{12} + c\left(z_{12} - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_{12}\,\hat{\mathbf{y}} - c\left(z_{12} - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O V
$\mathbf{B_{43}}$	=	$-(x_{12} - y_{12})\,\mathbf{a}_1 - (x_{12} + y_{12})\,\mathbf{a}_2 - z_{12}\,\mathbf{a}_3$	=	$-(ax_{12} + cz_{12}\cos\beta)\,\hat{\mathbf{x}} - by_{12}\,\hat{\mathbf{y}} - cz_{12}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O V
$\mathbf{B_{44}}$	=	$(x_{12} + y_{12})\,\mathbf{a}_1 + (x_{12} - y_{12})\,\mathbf{a}_2 + \left(z_{12} + \frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{12} + c\left(z_{12} + \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{12}\,\hat{\mathbf{y}} + c\left(z_{12} + \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O V
$\mathbf{B_{45}}$	=	$(x_{13} - y_{13})\,\mathbf{a}_1 + (x_{13} + y_{13})\,\mathbf{a}_2 + z_{13}\,\mathbf{a}_3$	=	$(ax_{13} + cz_{13}\cos\beta)\,\hat{\mathbf{x}} + by_{13}\,\hat{\mathbf{y}} + cz_{13}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VI
$\mathbf{B_{46}}$	=	$-(x_{13} + y_{13})\,\mathbf{a}_1 - (x_{13} - y_{13})\,\mathbf{a}_2 - \left(z_{13} - \frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_{13} + c\left(z_{13} - \frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_{13}\,\hat{\mathbf{y}} - c\left(z_{13} - \frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VI
$\mathbf{B_{47}}$	=	$-(x_{13} - y_{13})\,\mathbf{a}_1 - (x_{13} + y_{13})\,\mathbf{a}_2 - z_{13}\,\mathbf{a}_3$	=	$-(ax_{13} + cz_{13}\cos\beta)\,\hat{\mathbf{x}} - by_{13}\,\hat{\mathbf{y}} - cz_{13}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VI

$\mathbf{B}_{48}$	=	$\left(x_{13}+y_{13}\right)\,\mathbf{a}_1 + \left(x_{13}-y_{13}\right)\,\mathbf{a}_2 + \left(z_{13}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{13}+c\left(z_{13}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{13}\,\hat{\mathbf{y}} + c\left(z_{13}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VI
$\mathbf{B}_{49}$	=	$\left(x_{14}-y_{14}\right)\,\mathbf{a}_1 + \left(x_{14}+y_{14}\right)\,\mathbf{a}_2 + z_{14}\,\mathbf{a}_3$	=	$\left(ax_{14}+cz_{14}\cos\beta\right)\,\hat{\mathbf{x}} + by_{14}\,\hat{\mathbf{y}} + cz_{14}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VII
$\mathbf{B}_{50}$	=	$-\left(x_{14}+y_{14}\right)\,\mathbf{a}_1 - \left(x_{14}-y_{14}\right)\,\mathbf{a}_2 - \left(z_{14}-\frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_{14}+c\left(z_{14}-\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_{14}\,\hat{\mathbf{y}} - c\left(z_{14}-\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VII
$\mathbf{B}_{51}$	=	$-\left(x_{14}-y_{14}\right)\,\mathbf{a}_1 - \left(x_{14}+y_{14}\right)\,\mathbf{a}_2 - z_{14}\,\mathbf{a}_3$	=	$-\left(ax_{14}+cz_{14}\cos\beta\right)\,\hat{\mathbf{x}} - by_{14}\,\hat{\mathbf{y}} - cz_{14}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VII
$\mathbf{B}_{52}$	=	$\left(x_{14}+y_{14}\right)\,\mathbf{a}_1 + \left(x_{14}-y_{14}\right)\,\mathbf{a}_2 + \left(z_{14}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{14}+c\left(z_{14}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{14}\,\hat{\mathbf{y}} + c\left(z_{14}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VII
$\mathbf{B}_{53}$	=	$\left(x_{15}-y_{15}\right)\,\mathbf{a}_1 + \left(x_{15}+y_{15}\right)\,\mathbf{a}_2 + z_{15}\,\mathbf{a}_3$	=	$\left(ax_{15}+cz_{15}\cos\beta\right)\,\hat{\mathbf{x}} + by_{15}\,\hat{\mathbf{y}} + cz_{15}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VIII
$\mathbf{B}_{54}$	=	$-\left(x_{15}+y_{15}\right)\,\mathbf{a}_1 - \left(x_{15}-y_{15}\right)\,\mathbf{a}_2 - \left(z_{15}-\frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_{15}+c\left(z_{15}-\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_{15}\,\hat{\mathbf{y}} - c\left(z_{15}-\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VIII
$\mathbf{B}_{55}$	=	$-\left(x_{15}-y_{15}\right)\,\mathbf{a}_1 - \left(x_{15}+y_{15}\right)\,\mathbf{a}_2 - z_{15}\,\mathbf{a}_3$	=	$-\left(ax_{15}+cz_{15}\cos\beta\right)\,\hat{\mathbf{x}} - by_{15}\,\hat{\mathbf{y}} - cz_{15}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VIII
$\mathbf{B}_{56}$	=	$\left(x_{15}+y_{15}\right)\,\mathbf{a}_1 + \left(x_{15}-y_{15}\right)\,\mathbf{a}_2 + \left(z_{15}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{15}+c\left(z_{15}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{15}\,\hat{\mathbf{y}} + c\left(z_{15}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O VIII
$\mathbf{B}_{57}$	=	$\left(x_{16}-y_{16}\right)\,\mathbf{a}_1 + \left(x_{16}+y_{16}\right)\,\mathbf{a}_2 + z_{16}\,\mathbf{a}_3$	=	$\left(ax_{16}+cz_{16}\cos\beta\right)\,\hat{\mathbf{x}} + by_{16}\,\hat{\mathbf{y}} + cz_{16}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O IX
$\mathbf{B}_{58}$	=	$-\left(x_{16}+y_{16}\right)\,\mathbf{a}_1 - \left(x_{16}-y_{16}\right)\,\mathbf{a}_2 - \left(z_{16}-\frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_{16}+c\left(z_{16}-\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_{16}\,\hat{\mathbf{y}} - c\left(z_{16}-\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O IX
$\mathbf{B}_{59}$	=	$-\left(x_{16}-y_{16}\right)\,\mathbf{a}_1 - \left(x_{16}+y_{16}\right)\,\mathbf{a}_2 - z_{16}\,\mathbf{a}_3$	=	$-\left(ax_{16}+cz_{16}\cos\beta\right)\,\hat{\mathbf{x}} - by_{16}\,\hat{\mathbf{y}} - cz_{16}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O IX
$\mathbf{B}_{60}$	=	$\left(x_{16}+y_{16}\right)\,\mathbf{a}_1 + \left(x_{16}-y_{16}\right)\,\mathbf{a}_2 + \left(z_{16}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{16}+c\left(z_{16}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{16}\,\hat{\mathbf{y}} + c\left(z_{16}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O IX
$\mathbf{B}_{61}$	=	$\left(x_{17}-y_{17}\right)\,\mathbf{a}_1 + \left(x_{17}+y_{17}\right)\,\mathbf{a}_2 + z_{17}\,\mathbf{a}_3$	=	$\left(ax_{17}+cz_{17}\cos\beta\right)\,\hat{\mathbf{x}} + by_{17}\,\hat{\mathbf{y}} + cz_{17}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O X
$\mathbf{B}_{62}$	=	$-\left(x_{17}+y_{17}\right)\,\mathbf{a}_1 - \left(x_{17}-y_{17}\right)\,\mathbf{a}_2 - \left(z_{17}-\frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_{17}+c\left(z_{17}-\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_{17}\,\hat{\mathbf{y}} - c\left(z_{17}-\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O X
$\mathbf{B}_{63}$	=	$-\left(x_{17}-y_{17}\right)\,\mathbf{a}_1 - \left(x_{17}+y_{17}\right)\,\mathbf{a}_2 - z_{17}\,\mathbf{a}_3$	=	$-\left(ax_{17}+cz_{17}\cos\beta\right)\,\hat{\mathbf{x}} - by_{17}\,\hat{\mathbf{y}} - cz_{17}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O X
$\mathbf{B}_{64}$	=	$\left(x_{17}+y_{17}\right)\,\mathbf{a}_1 + \left(x_{17}-y_{17}\right)\,\mathbf{a}_2 + \left(z_{17}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{17}+c\left(z_{17}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{17}\,\hat{\mathbf{y}} + c\left(z_{17}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O X
$\mathbf{B}_{65}$	=	$\left(x_{18}-y_{18}\right)\,\mathbf{a}_1 + \left(x_{18}+y_{18}\right)\,\mathbf{a}_2 + z_{18}\,\mathbf{a}_3$	=	$\left(ax_{18}+cz_{18}\cos\beta\right)\,\hat{\mathbf{x}} + by_{18}\,\hat{\mathbf{y}} + cz_{18}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O XI
$\mathbf{B}_{66}$	=	$-\left(x_{18}+y_{18}\right)\,\mathbf{a}_1 - \left(x_{18}-y_{18}\right)\,\mathbf{a}_2 - \left(z_{18}-\frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_{18}+c\left(z_{18}-\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_{18}\,\hat{\mathbf{y}} - c\left(z_{18}-\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O XI
$\mathbf{B}_{67}$	=	$-\left(x_{18}-y_{18}\right)\,\mathbf{a}_1 - \left(x_{18}+y_{18}\right)\,\mathbf{a}_2 - z_{18}\,\mathbf{a}_3$	=	$-\left(ax_{18}+cz_{18}\cos\beta\right)\,\hat{\mathbf{x}} - by_{18}\,\hat{\mathbf{y}} - cz_{18}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O XI
$\mathbf{B}_{68}$	=	$\left(x_{18}+y_{18}\right)\,\mathbf{a}_1 + \left(x_{18}-y_{18}\right)\,\mathbf{a}_2 + \left(z_{18}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{18}+c\left(z_{18}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{18}\,\hat{\mathbf{y}} + c\left(z_{18}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O XI
$\mathbf{B}_{69}$	=	$\left(x_{19}-y_{19}\right)\,\mathbf{a}_1 + \left(x_{19}+y_{19}\right)\,\mathbf{a}_2 + z_{19}\,\mathbf{a}_3$	=	$\left(ax_{19}+cz_{19}\cos\beta\right)\,\hat{\mathbf{x}} + by_{19}\,\hat{\mathbf{y}} + cz_{19}\sin\beta\,\hat{\mathbf{z}}$	(8f)	O XII
$\mathbf{B}_{70}$	=	$-\left(x_{19}+y_{19}\right)\,\mathbf{a}_1 - \left(x_{19}-y_{19}\right)\,\mathbf{a}_2 - \left(z_{19}-\frac{1}{2}\right)\,\mathbf{a}_3$	=	$-\left(ax_{19}+c\left(z_{19}-\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} + by_{19}\,\hat{\mathbf{y}} - c\left(z_{19}-\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(8f)	O XII

$\mathbf{B_{71}}$	=	$-\left(x_{19}-y_{19}\right)\,\mathbf{a}_{1}-\left(x_{19}+y_{19}\right)\,\mathbf{a}_{2}-z_{19}\,\mathbf{a}_{3}$	=	$-\left(ax_{19}+cz_{19}\cos\beta\right)\,\mathbf{\hat{x}}-by_{19}\,\mathbf{\hat{y}}-cz_{19}\sin\beta\,\mathbf{\hat{z}}$	(8f)	O XII
$\mathbf{B_{72}}$	=	$\left(x_{19}+y_{19}\right)\,\mathbf{a}_{1}+\left(x_{19}-y_{19}\right)\,\mathbf{a}_{2}+\left(z_{19}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{19}+c\left(z_{19}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{19}\,\mathbf{\hat{y}}+c\left(z_{19}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(8f)	O XII
$\mathbf{B_{73}}$	=	$\left(x_{20}-y_{20}\right)\,\mathbf{a}_{1}+\left(x_{20}+y_{20}\right)\,\mathbf{a}_{2}+z_{20}\,\mathbf{a}_{3}$	=	$\left(ax_{20}+cz_{20}\cos\beta\right)\,\mathbf{\hat{x}}+by_{20}\,\mathbf{\hat{y}}+cz_{20}\sin\beta\,\mathbf{\hat{z}}$	(8f)	Rb III
$\mathbf{B_{74}}$	=	$-\left(x_{20}+y_{20}\right)\,\mathbf{a}_{1}-\left(x_{20}-y_{20}\right)\,\mathbf{a}_{2}-\left(z_{20}-\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$-\left(ax_{20}+c\left(z_{20}-\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}+by_{20}\,\mathbf{\hat{y}}-c\left(z_{20}-\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(8f)	Rb III
$\mathbf{B_{75}}$	=	$-\left(x_{20}-y_{20}\right)\,\mathbf{a}_{1}-\left(x_{20}+y_{20}\right)\,\mathbf{a}_{2}-z_{20}\,\mathbf{a}_{3}$	=	$-\left(ax_{20}+cz_{20}\cos\beta\right)\,\mathbf{\hat{x}}-by_{20}\,\mathbf{\hat{y}}-cz_{20}\sin\beta\,\mathbf{\hat{z}}$	(8f)	Rb III
$\mathbf{B_{76}}$	=	$\left(x_{20}+y_{20}\right)\,\mathbf{a}_{1}+\left(x_{20}-y_{20}\right)\,\mathbf{a}_{2}+\left(z_{20}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{20}+c\left(z_{20}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{20}\,\mathbf{\hat{y}}+c\left(z_{20}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(8f)	Rb III

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