Monoclinic (Cc) Low Tridymite (SiO_2) Structure: A2B_mC144_9_24a_12a-001

This structure originally had the label `A2B_mC144_9_24a_12a`. Calls to that address will be redirected here.

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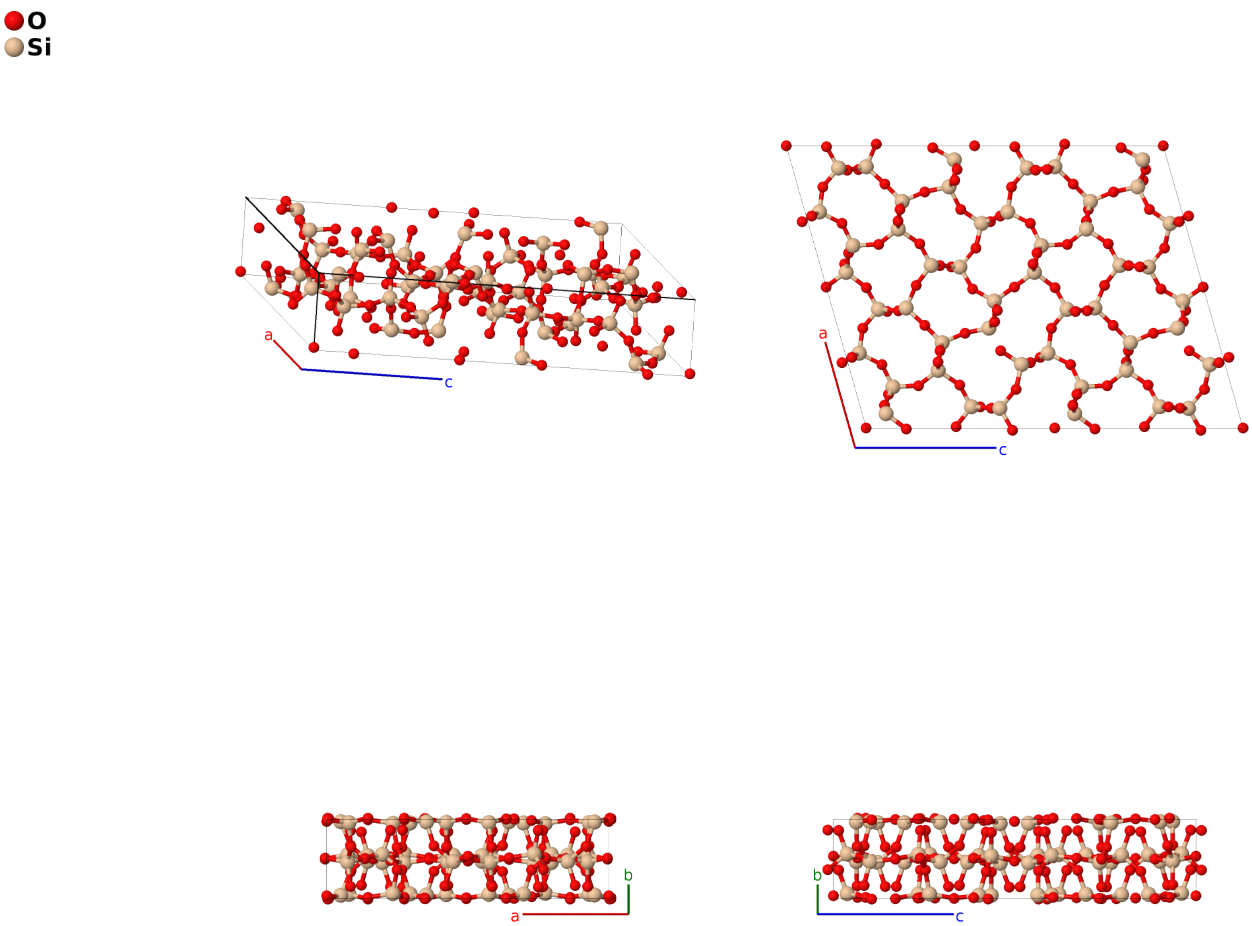
https://aflow.org/p/MK0W

https://aflow.org/p/A2B_mC144_9_24a_12a-001



Prototype O_2Si

AFLOW prototype label A2B_mC144_9_24a_12a-001

ICSD 34867

Pearson symbol mC144

Space group number 9

Space group symbol Cc

AFLOW prototype command `aflow --proto=A2B_mC144_9_24a_12a-001`
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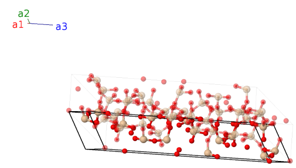
Base-centered Monoclinic primitive vectors

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



Basis vectors

		Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B_{1}}$	=	$(x_{1}-y_{1})\,\mathbf{a}_1 + (x_{1}+y_{1})\,\mathbf{a}_2 + z_{1}\,\mathbf{a}_3$	=	$(ax_{1}+cz_{1}\cos\beta)\,\hat{\mathbf{x}} + by_{1}\,\hat{\mathbf{y}} + cz_{1}\sin\beta\,\hat{\mathbf{z}}$	(4a)	O I
$\mathbf{B_{2}}$	=	$(x_{1}+y_{1})\,\mathbf{a}_1 + (x_{1}-y_{1})\,\mathbf{a}_2 + \left(z_{1}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{1}+c\left(z_{1}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{1}\,\hat{\mathbf{y}} + c\left(z_{1}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	O I
$\mathbf{B_{3}}$	=	$(x_{2}-y_{2})\,\mathbf{a}_1 + (x_{2}+y_{2})\,\mathbf{a}_2 + z_{2}\,\mathbf{a}_3$	=	$(ax_{2}+cz_{2}\cos\beta)\,\hat{\mathbf{x}} + by_{2}\,\hat{\mathbf{y}} + cz_{2}\sin\beta\,\hat{\mathbf{z}}$	(4a)	O II
$\mathbf{B_{4}}$	=	$(x_{2}+y_{2})\,\mathbf{a}_1 + (x_{2}-y_{2})\,\mathbf{a}_2 + \left(z_{2}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{2}+c\left(z_{2}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{2}\,\hat{\mathbf{y}} + c\left(z_{2}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	O II
$\mathbf{B_{5}}$	=	$(x_{3}-y_{3})\,\mathbf{a}_1 + (x_{3}+y_{3})\,\mathbf{a}_2 + z_{3}\,\mathbf{a}_3$	=	$(ax_{3}+cz_{3}\cos\beta)\,\hat{\mathbf{x}} + by_{3}\,\hat{\mathbf{y}} + cz_{3}\sin\beta\,\hat{\mathbf{z}}$	(4a)	O III
$\mathbf{B_{6}}$	=	$(x_{3}+y_{3})\,\mathbf{a}_1 + (x_{3}-y_{3})\,\mathbf{a}_2 + \left(z_{3}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{3}+c\left(z_{3}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{3}\,\hat{\mathbf{y}} + c\left(z_{3}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	O III
$\mathbf{B_{7}}$	=	$(x_{4}-y_{4})\,\mathbf{a}_1 + (x_{4}+y_{4})\,\mathbf{a}_2 + z_{4}\,\mathbf{a}_3$	=	$(ax_{4}+cz_{4}\cos\beta)\,\hat{\mathbf{x}} + by_{4}\,\hat{\mathbf{y}} + cz_{4}\sin\beta\,\hat{\mathbf{z}}$	(4a)	O IV
$\mathbf{B_{8}}$	=	$(x_{4}+y_{4})\,\mathbf{a}_1 + (x_{4}-y_{4})\,\mathbf{a}_2 + \left(z_{4}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{4}+c\left(z_{4}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{4}\,\hat{\mathbf{y}} + c\left(z_{4}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	O IV
$\mathbf{B_{9}}$	=	$(x_{5}-y_{5})\,\mathbf{a}_1 + (x_{5}+y_{5})\,\mathbf{a}_2 + z_{5}\,\mathbf{a}_3$	=	$(ax_{5}+cz_{5}\cos\beta)\,\hat{\mathbf{x}} + by_{5}\,\hat{\mathbf{y}} + cz_{5}\sin\beta\,\hat{\mathbf{z}}$	(4a)	O V
$\mathbf{B_{10}}$	=	$(x_{5}+y_{5})\,\mathbf{a}_1 + (x_{5}-y_{5})\,\mathbf{a}_2 + \left(z_{5}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{5}+c\left(z_{5}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{5}\,\hat{\mathbf{y}} + c\left(z_{5}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	O V
$\mathbf{B_{11}}$	=	$(x_{6}-y_{6})\,\mathbf{a}_1 + (x_{6}+y_{6})\,\mathbf{a}_2 + z_{6}\,\mathbf{a}_3$	=	$(ax_{6}+cz_{6}\cos\beta)\,\hat{\mathbf{x}} + by_{6}\,\hat{\mathbf{y}} + cz_{6}\sin\beta\,\hat{\mathbf{z}}$	(4a)	O VI
$\mathbf{B_{12}}$	=	$(x_{6}+y_{6})\,\mathbf{a}_1 + (x_{6}-y_{6})\,\mathbf{a}_2 + \left(z_{6}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{6}+c\left(z_{6}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{6}\,\hat{\mathbf{y}} + c\left(z_{6}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	O VI
$\mathbf{B_{13}}$	=	$(x_{7}-y_{7})\,\mathbf{a}_1 + (x_{7}+y_{7})\,\mathbf{a}_2 + z_{7}\,\mathbf{a}_3$	=	$(ax_{7}+cz_{7}\cos\beta)\,\hat{\mathbf{x}} + by_{7}\,\hat{\mathbf{y}} + cz_{7}\sin\beta\,\hat{\mathbf{z}}$	(4a)	O VII

$\mathbf{B_{14}}$	=	$\left(x_{7}+y_{7}\right)\,\mathbf{a}_{1}+\left(x_{7}-y_{7}\right)\,\mathbf{a}_{2}+\left(z_{7}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{7}+c\left(z_{7}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{7}\,\mathbf{\hat{y}}+c\left(z_{7}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O VII
$\mathbf{B_{15}}$	=	$\left(x_{8}-y_{8}\right)\,\mathbf{a}_{1}+\left(x_{8}+y_{8}\right)\,\mathbf{a}_{2}+z_{8}\,\mathbf{a}_{3}$	=	$\left(ax_{8}+cz_{8}\cos\beta\right)\,\mathbf{\hat{x}}+by_{8}\,\mathbf{\hat{y}}+cz_{8}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O VIII
$\mathbf{B_{16}}$	=	$\left(x_{8}+y_{8}\right)\,\mathbf{a}_{1}+\left(x_{8}-y_{8}\right)\,\mathbf{a}_{2}+\left(z_{8}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{8}+c\left(z_{8}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{8}\,\mathbf{\hat{y}}+c\left(z_{8}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O VIII
$\mathbf{B_{17}}$	=	$\left(x_{9}-y_{9}\right)\,\mathbf{a}_{1}+\left(x_{9}+y_{9}\right)\,\mathbf{a}_{2}+z_{9}\,\mathbf{a}_{3}$	=	$\left(ax_{9}+cz_{9}\cos\beta\right)\,\mathbf{\hat{x}}+by_{9}\,\mathbf{\hat{y}}+cz_{9}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O IX
$\mathbf{B_{18}}$	=	$\left(x_{9}+y_{9}\right)\,\mathbf{a}_{1}+\left(x_{9}-y_{9}\right)\,\mathbf{a}_{2}+\left(z_{9}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{9}+c\left(z_{9}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{9}\,\mathbf{\hat{y}}+c\left(z_{9}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O IX
$\mathbf{B_{19}}$	=	$\left(x_{10}-y_{10}\right)\,\mathbf{a}_{1}+\left(x_{10}+y_{10}\right)\,\mathbf{a}_{2}+z_{10}\,\mathbf{a}_{3}$	=	$\left(ax_{10}+cz_{10}\cos\beta\right)\,\mathbf{\hat{x}}+by_{10}\,\mathbf{\hat{y}}+cz_{10}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O X
$\mathbf{B_{20}}$	=	$\left(x_{10}+y_{10}\right)\,\mathbf{a}_{1}+\left(x_{10}-y_{10}\right)\,\mathbf{a}_{2}+\left(z_{10}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{10}+c\left(z_{10}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{10}\,\mathbf{\hat{y}}+c\left(z_{10}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O X
$\mathbf{B_{21}}$	=	$\left(x_{11}-y_{11}\right)\,\mathbf{a}_{1}+\left(x_{11}+y_{11}\right)\,\mathbf{a}_{2}+z_{11}\,\mathbf{a}_{3}$	=	$\left(ax_{11}+cz_{11}\cos\beta\right)\,\mathbf{\hat{x}}+by_{11}\,\mathbf{\hat{y}}+cz_{11}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XI
$\mathbf{B_{22}}$	=	$\left(x_{11}+y_{11}\right)\,\mathbf{a}_{1}+\left(x_{11}-y_{11}\right)\,\mathbf{a}_{2}+\left(z_{11}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{11}+c\left(z_{11}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{11}\,\mathbf{\hat{y}}+c\left(z_{11}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XI
$\mathbf{B_{23}}$	=	$\left(x_{12}-y_{12}\right)\,\mathbf{a}_{1}+\left(x_{12}+y_{12}\right)\,\mathbf{a}_{2}+z_{12}\,\mathbf{a}_{3}$	=	$\left(ax_{12}+cz_{12}\cos\beta\right)\,\mathbf{\hat{x}}+by_{12}\,\mathbf{\hat{y}}+cz_{12}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XII
$\mathbf{B_{24}}$	=	$\left(x_{12}+y_{12}\right)\,\mathbf{a}_{1}+\left(x_{12}-y_{12}\right)\,\mathbf{a}_{2}+\left(z_{12}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{12}+c\left(z_{12}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{12}\,\mathbf{\hat{y}}+c\left(z_{12}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XII
$\mathbf{B_{25}}$	=	$\left(x_{13}-y_{13}\right)\,\mathbf{a}_{1}+\left(x_{13}+y_{13}\right)\,\mathbf{a}_{2}+z_{13}\,\mathbf{a}_{3}$	=	$\left(ax_{13}+cz_{13}\cos\beta\right)\,\mathbf{\hat{x}}+by_{13}\,\mathbf{\hat{y}}+cz_{13}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XIII
$\mathbf{B_{26}}$	=	$\left(x_{13}+y_{13}\right)\,\mathbf{a}_{1}+\left(x_{13}-y_{13}\right)\,\mathbf{a}_{2}+\left(z_{13}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{13}+c\left(z_{13}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{13}\,\mathbf{\hat{y}}+c\left(z_{13}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XIII
$\mathbf{B_{27}}$	=	$\left(x_{14}-y_{14}\right)\,\mathbf{a}_{1}+\left(x_{14}+y_{14}\right)\,\mathbf{a}_{2}+z_{14}\,\mathbf{a}_{3}$	=	$\left(ax_{14}+cz_{14}\cos\beta\right)\,\mathbf{\hat{x}}+by_{14}\,\mathbf{\hat{y}}+cz_{14}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XIV
$\mathbf{B_{28}}$	=	$\left(x_{14}+y_{14}\right)\,\mathbf{a}_{1}+\left(x_{14}-y_{14}\right)\,\mathbf{a}_{2}+\left(z_{14}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{14}+c\left(z_{14}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{14}\,\mathbf{\hat{y}}+c\left(z_{14}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XIV
$\mathbf{B_{29}}$	=	$\left(x_{15}-y_{15}\right)\,\mathbf{a}_{1}+\left(x_{15}+y_{15}\right)\,\mathbf{a}_{2}+z_{15}\,\mathbf{a}_{3}$	=	$\left(ax_{15}+cz_{15}\cos\beta\right)\,\mathbf{\hat{x}}+by_{15}\,\mathbf{\hat{y}}+cz_{15}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XV
$\mathbf{B_{30}}$	=	$\left(x_{15}+y_{15}\right)\,\mathbf{a}_{1}+\left(x_{15}-y_{15}\right)\,\mathbf{a}_{2}+\left(z_{15}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{15}+c\left(z_{15}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{15}\,\mathbf{\hat{y}}+c\left(z_{15}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XV
$\mathbf{B_{31}}$	=	$\left(x_{16}-y_{16}\right)\,\mathbf{a}_{1}+\left(x_{16}+y_{16}\right)\,\mathbf{a}_{2}+z_{16}\,\mathbf{a}_{3}$	=	$\left(ax_{16}+cz_{16}\cos\beta\right)\,\mathbf{\hat{x}}+by_{16}\,\mathbf{\hat{y}}+cz_{16}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XVI
$\mathbf{B_{32}}$	=	$\left(x_{16}+y_{16}\right)\,\mathbf{a}_{1}+\left(x_{16}-y_{16}\right)\,\mathbf{a}_{2}+\left(z_{16}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{16}+c\left(z_{16}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{16}\,\mathbf{\hat{y}}+c\left(z_{16}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XVI
$\mathbf{B_{33}}$	=	$\left(x_{17}-y_{17}\right)\,\mathbf{a}_{1}+\left(x_{17}+y_{17}\right)\,\mathbf{a}_{2}+z_{17}\,\mathbf{a}_{3}$	=	$\left(ax_{17}+cz_{17}\cos\beta\right)\,\mathbf{\hat{x}}+by_{17}\,\mathbf{\hat{y}}+cz_{17}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XVII
$\mathbf{B_{34}}$	=	$\left(x_{17}+y_{17}\right)\,\mathbf{a}_{1}+\left(x_{17}-y_{17}\right)\,\mathbf{a}_{2}+\left(z_{17}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{17}+c\left(z_{17}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{17}\,\mathbf{\hat{y}}+c\left(z_{17}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XVII
$\mathbf{B_{35}}$	=	$\left(x_{18}-y_{18}\right)\,\mathbf{a}_{1}+\left(x_{18}+y_{18}\right)\,\mathbf{a}_{2}+z_{18}\,\mathbf{a}_{3}$	=	$\left(ax_{18}+cz_{18}\cos\beta\right)\,\mathbf{\hat{x}}+by_{18}\,\mathbf{\hat{y}}+cz_{18}\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XVIII
$\mathbf{B_{36}}$	=	$\left(x_{18}+y_{18}\right)\,\mathbf{a}_{1}+\left(x_{18}-y_{18}\right)\,\mathbf{a}_{2}+\left(z_{18}+\frac{1}{2}\right)\,\mathbf{a}_{3}$	=	$\left(ax_{18}+c\left(z_{18}+\frac{1}{2}\right)\cos\beta\right)\,\mathbf{\hat{x}}-by_{18}\,\mathbf{\hat{y}}+c\left(z_{18}+\frac{1}{2}\right)\sin\beta\,\mathbf{\hat{z}}$	(4a)	O XVIII

$\mathbf{B_{37}}$	=	$\left(x_{19} - y_{19}\right) \mathbf{a}_1 + \left(x_{19} + y_{19}\right) \mathbf{a}_2 + z_{19} \mathbf{a}_3$	=	$\left(ax_{19} + cz_{19} \cos\beta\right) \mathbf{\hat{x}} + by_{19} \mathbf{\hat{y}} + cz_{19} \sin\beta \mathbf{\hat{z}}$	(4a)	O XIX
$\mathbf{B_{38}}$	=	$\left(x_{19} + y_{19}\right) \mathbf{a}_1 + \left(x_{19} - y_{19}\right) \mathbf{a}_2 + \left(z_{19} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{19} + c\left(z_{19} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{19} \mathbf{\hat{y}} + c\left(z_{19} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	O XIX
$\mathbf{B_{39}}$	=	$\left(x_{20} - y_{20}\right) \mathbf{a}_1 + \left(x_{20} + y_{20}\right) \mathbf{a}_2 + z_{20} \mathbf{a}_3$	=	$\left(ax_{20} + cz_{20} \cos\beta\right) \mathbf{\hat{x}} + by_{20} \mathbf{\hat{y}} + cz_{20} \sin\beta \mathbf{\hat{z}}$	(4a)	O XX
$\mathbf{B_{40}}$	=	$\left(x_{20} + y_{20}\right) \mathbf{a}_1 + \left(x_{20} - y_{20}\right) \mathbf{a}_2 + \left(z_{20} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{20} + c\left(z_{20} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{20} \mathbf{\hat{y}} + c\left(z_{20} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	O XX
$\mathbf{B_{41}}$	=	$\left(x_{21} - y_{21}\right) \mathbf{a}_1 + \left(x_{21} + y_{21}\right) \mathbf{a}_2 + z_{21} \mathbf{a}_3$	=	$\left(ax_{21} + cz_{21} \cos\beta\right) \mathbf{\hat{x}} + by_{21} \mathbf{\hat{y}} + cz_{21} \sin\beta \mathbf{\hat{z}}$	(4a)	O XXI
$\mathbf{B_{42}}$	=	$\left(x_{21} + y_{21}\right) \mathbf{a}_1 + \left(x_{21} - y_{21}\right) \mathbf{a}_2 + \left(z_{21} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{21} + c\left(z_{21} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{21} \mathbf{\hat{y}} + c\left(z_{21} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	O XXI
$\mathbf{B_{43}}$	=	$\left(x_{22} - y_{22}\right) \mathbf{a}_1 + \left(x_{22} + y_{22}\right) \mathbf{a}_2 + z_{22} \mathbf{a}_3$	=	$\left(ax_{22} + cz_{22} \cos\beta\right) \mathbf{\hat{x}} + by_{22} \mathbf{\hat{y}} + cz_{22} \sin\beta \mathbf{\hat{z}}$	(4a)	O XXII
$\mathbf{B_{44}}$	=	$\left(x_{22} + y_{22}\right) \mathbf{a}_1 + \left(x_{22} - y_{22}\right) \mathbf{a}_2 + \left(z_{22} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{22} + c\left(z_{22} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{22} \mathbf{\hat{y}} + c\left(z_{22} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	O XXII
$\mathbf{B_{45}}$	=	$\left(x_{23} - y_{23}\right) \mathbf{a}_1 + \left(x_{23} + y_{23}\right) \mathbf{a}_2 + z_{23} \mathbf{a}_3$	=	$\left(ax_{23} + cz_{23} \cos\beta\right) \mathbf{\hat{x}} + by_{23} \mathbf{\hat{y}} + cz_{23} \sin\beta \mathbf{\hat{z}}$	(4a)	O XXIII
$\mathbf{B_{46}}$	=	$\left(x_{23} + y_{23}\right) \mathbf{a}_1 + \left(x_{23} - y_{23}\right) \mathbf{a}_2 + \left(z_{23} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{23} + c\left(z_{23} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{23} \mathbf{\hat{y}} + c\left(z_{23} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	O XXIII
$\mathbf{B_{47}}$	=	$\left(x_{24} - y_{24}\right) \mathbf{a}_1 + \left(x_{24} + y_{24}\right) \mathbf{a}_2 + z_{24} \mathbf{a}_3$	=	$\left(ax_{24} + cz_{24} \cos\beta\right) \mathbf{\hat{x}} + by_{24} \mathbf{\hat{y}} + cz_{24} \sin\beta \mathbf{\hat{z}}$	(4a)	O XXIV
$\mathbf{B_{48}}$	=	$\left(x_{24} + y_{24}\right) \mathbf{a}_1 + \left(x_{24} - y_{24}\right) \mathbf{a}_2 + \left(z_{24} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{24} + c\left(z_{24} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{24} \mathbf{\hat{y}} + c\left(z_{24} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	O XXIV
$\mathbf{B_{49}}$	=	$\left(x_{25} - y_{25}\right) \mathbf{a}_1 + \left(x_{25} + y_{25}\right) \mathbf{a}_2 + z_{25} \mathbf{a}_3$	=	$\left(ax_{25} + cz_{25} \cos\beta\right) \mathbf{\hat{x}} + by_{25} \mathbf{\hat{y}} + cz_{25} \sin\beta \mathbf{\hat{z}}$	(4a)	Si I
$\mathbf{B_{50}}$	=	$\left(x_{25} + y_{25}\right) \mathbf{a}_1 + \left(x_{25} - y_{25}\right) \mathbf{a}_2 + \left(z_{25} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{25} + c\left(z_{25} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{25} \mathbf{\hat{y}} + c\left(z_{25} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	Si I
$\mathbf{B_{51}}$	=	$\left(x_{26} - y_{26}\right) \mathbf{a}_1 + \left(x_{26} + y_{26}\right) \mathbf{a}_2 + z_{26} \mathbf{a}_3$	=	$\left(ax_{26} + cz_{26} \cos\beta\right) \mathbf{\hat{x}} + by_{26} \mathbf{\hat{y}} + cz_{26} \sin\beta \mathbf{\hat{z}}$	(4a)	Si II
$\mathbf{B_{52}}$	=	$\left(x_{26} + y_{26}\right) \mathbf{a}_1 + \left(x_{26} - y_{26}\right) \mathbf{a}_2 + \left(z_{26} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{26} + c\left(z_{26} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{26} \mathbf{\hat{y}} + c\left(z_{26} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	Si II
$\mathbf{B_{53}}$	=	$\left(x_{27} - y_{27}\right) \mathbf{a}_1 + \left(x_{27} + y_{27}\right) \mathbf{a}_2 + z_{27} \mathbf{a}_3$	=	$\left(ax_{27} + cz_{27} \cos\beta\right) \mathbf{\hat{x}} + by_{27} \mathbf{\hat{y}} + cz_{27} \sin\beta \mathbf{\hat{z}}$	(4a)	Si III
$\mathbf{B_{54}}$	=	$\left(x_{27} + y_{27}\right) \mathbf{a}_1 + \left(x_{27} - y_{27}\right) \mathbf{a}_2 + \left(z_{27} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{27} + c\left(z_{27} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{27} \mathbf{\hat{y}} + c\left(z_{27} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	Si III
$\mathbf{B_{55}}$	=	$\left(x_{28} - y_{28}\right) \mathbf{a}_1 + \left(x_{28} + y_{28}\right) \mathbf{a}_2 + z_{28} \mathbf{a}_3$	=	$\left(ax_{28} + cz_{28} \cos\beta\right) \mathbf{\hat{x}} + by_{28} \mathbf{\hat{y}} + cz_{28} \sin\beta \mathbf{\hat{z}}$	(4a)	Si IV
$\mathbf{B_{56}}$	=	$\left(x_{28} + y_{28}\right) \mathbf{a}_1 + \left(x_{28} - y_{28}\right) \mathbf{a}_2 + \left(z_{28} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{28} + c\left(z_{28} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{28} \mathbf{\hat{y}} + c\left(z_{28} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	Si IV
$\mathbf{B_{57}}$	=	$\left(x_{29} - y_{29}\right) \mathbf{a}_1 + \left(x_{29} + y_{29}\right) \mathbf{a}_2 + z_{29} \mathbf{a}_3$	=	$\left(ax_{29} + cz_{29} \cos\beta\right) \mathbf{\hat{x}} + by_{29} \mathbf{\hat{y}} + cz_{29} \sin\beta \mathbf{\hat{z}}$	(4a)	Si V
$\mathbf{B_{58}}$	=	$\left(x_{29} + y_{29}\right) \mathbf{a}_1 + \left(x_{29} - y_{29}\right) \mathbf{a}_2 + \left(z_{29} + \frac{1}{2}\right) \mathbf{a}_3$	=	$\left(ax_{29} + c\left(z_{29} + \frac{1}{2}\right) \cos\beta\right) \mathbf{\hat{x}} - by_{29} \mathbf{\hat{y}} + c\left(z_{29} + \frac{1}{2}\right) \sin\beta \mathbf{\hat{z}}$	(4a)	Si V
$\mathbf{B_{59}}$	=	$\left(x_{30} - y_{30}\right) \mathbf{a}_1 + \left(x_{30} + y_{30}\right) \mathbf{a}_2 + z_{30} \mathbf{a}_3$	=	$\left(ax_{30} + cz_{30} \cos\beta\right) \mathbf{\hat{x}} + by_{30} \mathbf{\hat{y}} + cz_{30} \sin\beta \mathbf{\hat{z}}$	(4a)	Si VI

$\mathbf{B_{60}}$	=	$\left(x_{30}+y_{30}\right)\,\mathbf{a}_1 + \left(x_{30}-y_{30}\right)\,\mathbf{a}_2 + \left(z_{30}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{30}+c\left(z_{30}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{30}\,\hat{\mathbf{y}} + c\left(z_{30}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si VI
$\mathbf{B_{61}}$	=	$\left(x_{31}-y_{31}\right)\,\mathbf{a}_1 + \left(x_{31}+y_{31}\right)\,\mathbf{a}_2 + z_{31}\,\mathbf{a}_3$	=	$\left(ax_{31}+cz_{31}\cos\beta\right)\,\hat{\mathbf{x}} + by_{31}\,\hat{\mathbf{y}} + cz_{31}\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si VII
$\mathbf{B_{62}}$	=	$\left(x_{31}+y_{31}\right)\,\mathbf{a}_1 + \left(x_{31}-y_{31}\right)\,\mathbf{a}_2 + \left(z_{31}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{31}+c\left(z_{31}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{31}\,\hat{\mathbf{y}} + c\left(z_{31}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si VII
$\mathbf{B_{63}}$	=	$\left(x_{32}-y_{32}\right)\,\mathbf{a}_1 + \left(x_{32}+y_{32}\right)\,\mathbf{a}_2 + z_{32}\,\mathbf{a}_3$	=	$\left(ax_{32}+cz_{32}\cos\beta\right)\,\hat{\mathbf{x}} + by_{32}\,\hat{\mathbf{y}} + cz_{32}\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si VIII
$\mathbf{B_{64}}$	=	$\left(x_{32}+y_{32}\right)\,\mathbf{a}_1 + \left(x_{32}-y_{32}\right)\,\mathbf{a}_2 + \left(z_{32}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{32}+c\left(z_{32}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{32}\,\hat{\mathbf{y}} + c\left(z_{32}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si VIII
$\mathbf{B_{65}}$	=	$\left(x_{33}-y_{33}\right)\,\mathbf{a}_1 + \left(x_{33}+y_{33}\right)\,\mathbf{a}_2 + z_{33}\,\mathbf{a}_3$	=	$\left(ax_{33}+cz_{33}\cos\beta\right)\,\hat{\mathbf{x}} + by_{33}\,\hat{\mathbf{y}} + cz_{33}\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si IX
$\mathbf{B_{66}}$	=	$\left(x_{33}+y_{33}\right)\,\mathbf{a}_1 + \left(x_{33}-y_{33}\right)\,\mathbf{a}_2 + \left(z_{33}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{33}+c\left(z_{33}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{33}\,\hat{\mathbf{y}} + c\left(z_{33}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si IX
$\mathbf{B_{67}}$	=	$\left(x_{34}-y_{34}\right)\,\mathbf{a}_1 + \left(x_{34}+y_{34}\right)\,\mathbf{a}_2 + z_{34}\,\mathbf{a}_3$	=	$\left(ax_{34}+cz_{34}\cos\beta\right)\,\hat{\mathbf{x}} + by_{34}\,\hat{\mathbf{y}} + cz_{34}\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si X
$\mathbf{B_{68}}$	=	$\left(x_{34}+y_{34}\right)\,\mathbf{a}_1 + \left(x_{34}-y_{34}\right)\,\mathbf{a}_2 + \left(z_{34}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{34}+c\left(z_{34}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{34}\,\hat{\mathbf{y}} + c\left(z_{34}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si X
$\mathbf{B_{69}}$	=	$\left(x_{35}-y_{35}\right)\,\mathbf{a}_1 + \left(x_{35}+y_{35}\right)\,\mathbf{a}_2 + z_{35}\,\mathbf{a}_3$	=	$\left(ax_{35}+cz_{35}\cos\beta\right)\,\hat{\mathbf{x}} + by_{35}\,\hat{\mathbf{y}} + cz_{35}\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si XI
$\mathbf{B_{70}}$	=	$\left(x_{35}+y_{35}\right)\,\mathbf{a}_1 + \left(x_{35}-y_{35}\right)\,\mathbf{a}_2 + \left(z_{35}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{35}+c\left(z_{35}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{35}\,\hat{\mathbf{y}} + c\left(z_{35}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si XI
$\mathbf{B_{71}}$	=	$\left(x_{36}-y_{36}\right)\,\mathbf{a}_1 + \left(x_{36}+y_{36}\right)\,\mathbf{a}_2 + z_{36}\,\mathbf{a}_3$	=	$\left(ax_{36}+cz_{36}\cos\beta\right)\,\hat{\mathbf{x}} + by_{36}\,\hat{\mathbf{y}} + cz_{36}\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si XII
$\mathbf{B_{72}}$	=	$\left(x_{36}+y_{36}\right)\,\mathbf{a}_1 + \left(x_{36}-y_{36}\right)\,\mathbf{a}_2 + \left(z_{36}+\frac{1}{2}\right)\,\mathbf{a}_3$	=	$\left(ax_{36}+c\left(z_{36}+\frac{1}{2}\right)\cos\beta\right)\,\hat{\mathbf{x}} - by_{36}\,\hat{\mathbf{y}} + c\left(z_{36}+\frac{1}{2}\right)\sin\beta\,\hat{\mathbf{z}}$	(4a)	Si XII

References

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