

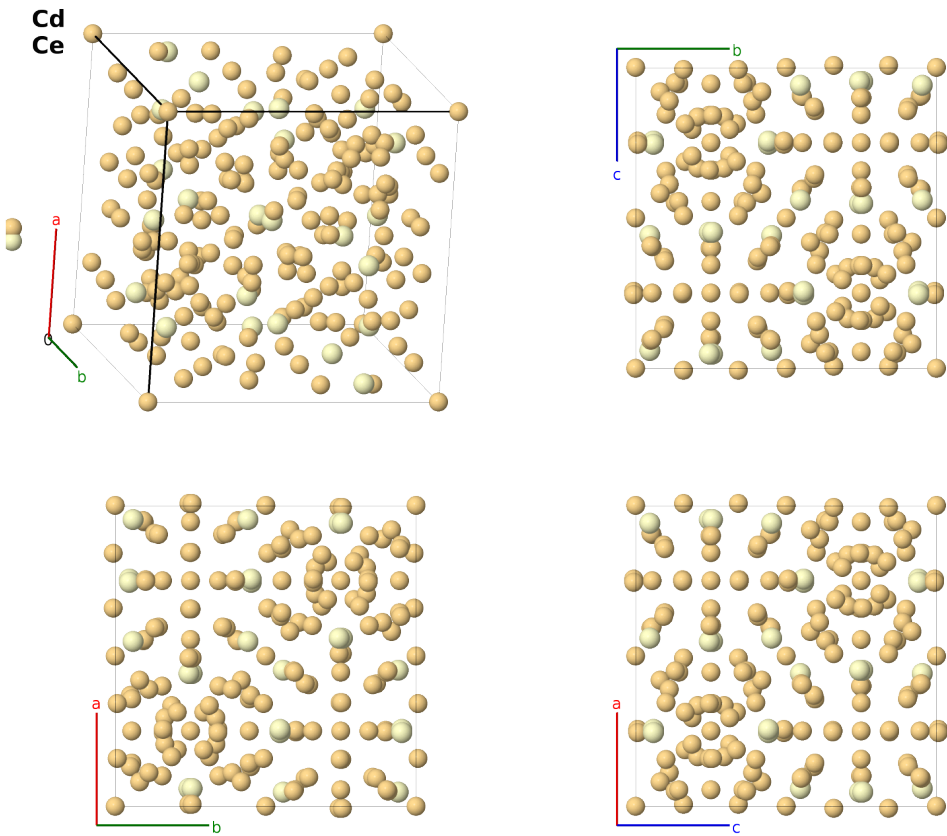
Ce₆Cd₃₇ Structure: A41B6_cP188_201_b2efg5h_h-001

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<https://aflow.org/prototype-encyclopedia/D917>

https://aflow.org/prototype-encyclopedia/A41B6_cP188_201_b2efg5h_h-001

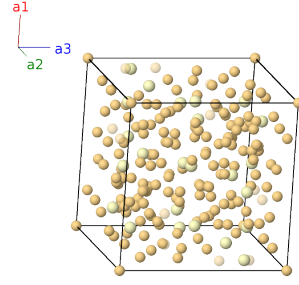


Prototype	Cd ₃₇ Ce ₆
AFLOW prototype label	A41B6_cP188_201_b2efg5h_h-001
ICSD	54599
CCDC	1619085
Pearson symbol	cP188
Space group number	201
Space group symbol	$Pn\bar{3}$
AFLOW prototype command	<pre>aflow --proto=A41B6_cP188_201_b2efg5h_h-001 --params=a, x₂, x₃, x₄, x₅, x₆, y₆, z₆, x₇, y₇, z₇, x₈, y₈, z₈, x₉, y₉, z₉, x₁₀, y₁₀, z₁₀, x₁₁, y₁₁, z₁₁</pre>

- The compound now known as $\text{Ce}_6\text{Cd}_{37}$ was originally thought to have the YCd_6 structure, but (Armbrüster, 2000) found that it actually has the structure shown here.
- All of the sites are fully occupied except the one labeled Cd-X, where 2/3 of the sites are vacant, giving the correct stoichiometry. We use the data taken at 298K.
- (Armbrüster, 2000) give the structure of $\text{Ce}_6\text{Cd}_{37}$ in setting 1 of space group $Pn\bar{3}$ #201. We used FINDSYM to change this to the standard setting 2.
- (Armbrüster, 2000) also present a slightly different version of the YCd_6 structure than that presented in the prototype paper, (Larson, 1972).
- We used FINDSYM to transform this to the standard second setting, which places a cerium atom and the inversion site at the origin.

Simple Cubic primitive vectors

$$\begin{aligned}\mathbf{a}_1 &= a \hat{\mathbf{x}} \\ \mathbf{a}_2 &= a \hat{\mathbf{y}} \\ \mathbf{a}_3 &= a \hat{\mathbf{z}}\end{aligned}$$



Basis vectors

	Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B}_1$	$= 0$	$=$	0	(4b)	Cd I
$\mathbf{B}_2$	$= \frac{1}{2} \mathbf{a}_1 + \frac{1}{2} \mathbf{a}_2$	$=$	$\frac{1}{2} a \hat{\mathbf{x}} + \frac{1}{2} a \hat{\mathbf{y}}$	(4b)	Cd I
$\mathbf{B}_3$	$= \frac{1}{2} \mathbf{a}_1 + \frac{1}{2} \mathbf{a}_3$	$=$	$\frac{1}{2} a \hat{\mathbf{x}} + \frac{1}{2} a \hat{\mathbf{z}}$	(4b)	Cd I
$\mathbf{B}_4$	$= \frac{1}{2} \mathbf{a}_2 + \frac{1}{2} \mathbf{a}_3$	$=$	$\frac{1}{2} a \hat{\mathbf{y}} + \frac{1}{2} a \hat{\mathbf{z}}$	(4b)	Cd I
$\mathbf{B}_5$	$= x_2 \mathbf{a}_1 + x_2 \mathbf{a}_2 + x_2 \mathbf{a}_3$	$=$	$ax_2 \hat{\mathbf{x}} + ax_2 \hat{\mathbf{y}} + ax_2 \hat{\mathbf{z}}$	(8e)	Cd II
$\mathbf{B}_6$	$= -\left(x_2 - \frac{1}{2}\right) \mathbf{a}_1 - \left(x_2 - \frac{1}{2}\right) \mathbf{a}_2 + x_2 \mathbf{a}_3$	$=$	$-a\left(x_2 - \frac{1}{2}\right) \hat{\mathbf{x}} - a\left(x_2 - \frac{1}{2}\right) \hat{\mathbf{y}} + ax_2 \hat{\mathbf{z}}$	(8e)	Cd II
$\mathbf{B}_7$	$= -\left(x_2 - \frac{1}{2}\right) \mathbf{a}_1 + x_2 \mathbf{a}_2 - \left(x_2 - \frac{1}{2}\right) \mathbf{a}_3$	$=$	$-a\left(x_2 - \frac{1}{2}\right) \hat{\mathbf{x}} + ax_2 \hat{\mathbf{y}} - a\left(x_2 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(8e)	Cd II
$\mathbf{B}_8$	$= x_2 \mathbf{a}_1 - \left(x_2 - \frac{1}{2}\right) \mathbf{a}_2 - \left(x_2 - \frac{1}{2}\right) \mathbf{a}_3$	$=$	$ax_2 \hat{\mathbf{x}} - a\left(x_2 - \frac{1}{2}\right) \hat{\mathbf{y}} - a\left(x_2 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(8e)	Cd II
$\mathbf{B}_9$	$= -x_2 \mathbf{a}_1 - x_2 \mathbf{a}_2 - x_2 \mathbf{a}_3$	$=$	$-ax_2 \hat{\mathbf{x}} - ax_2 \hat{\mathbf{y}} - ax_2 \hat{\mathbf{z}}$	(8e)	Cd II
$\mathbf{B}_{10}$	$= \left(x_2 + \frac{1}{2}\right) \mathbf{a}_1 + \left(x_2 + \frac{1}{2}\right) \mathbf{a}_2 - x_2 \mathbf{a}_3$	$=$	$a\left(x_2 + \frac{1}{2}\right) \hat{\mathbf{x}} + a\left(x_2 + \frac{1}{2}\right) \hat{\mathbf{y}} - ax_2 \hat{\mathbf{z}}$	(8e)	Cd II
$\mathbf{B}_{11}$	$= \left(x_2 + \frac{1}{2}\right) \mathbf{a}_1 - x_2 \mathbf{a}_2 + \left(x_2 + \frac{1}{2}\right) \mathbf{a}_3$	$=$	$a\left(x_2 + \frac{1}{2}\right) \hat{\mathbf{x}} - ax_2 \hat{\mathbf{y}} + a\left(x_2 + \frac{1}{2}\right) \hat{\mathbf{z}}$	(8e)	Cd II
$\mathbf{B}_{12}$	$= -x_2 \mathbf{a}_1 + \left(x_2 + \frac{1}{2}\right) \mathbf{a}_2 + \left(x_2 + \frac{1}{2}\right) \mathbf{a}_3$	$=$	$-ax_2 \hat{\mathbf{x}} + a\left(x_2 + \frac{1}{2}\right) \hat{\mathbf{y}} + a\left(x_2 + \frac{1}{2}\right) \hat{\mathbf{z}}$	(8e)	Cd II
$\mathbf{B}_{13}$	$= x_3 \mathbf{a}_1 + x_3 \mathbf{a}_2 + x_3 \mathbf{a}_3$	$=$	$ax_3 \hat{\mathbf{x}} + ax_3 \hat{\mathbf{y}} + ax_3 \hat{\mathbf{z}}$	(8e)	Cd III
$\mathbf{B}_{14}$	$= -\left(x_3 - \frac{1}{2}\right) \mathbf{a}_1 - \left(x_3 - \frac{1}{2}\right) \mathbf{a}_2 + x_3 \mathbf{a}_3$	$=$	$-a\left(x_3 - \frac{1}{2}\right) \hat{\mathbf{x}} - a\left(x_3 - \frac{1}{2}\right) \hat{\mathbf{y}} + ax_3 \hat{\mathbf{z}}$	(8e)	Cd III

$\mathbf{B}_{15} =$	$-\left(x_3 - \frac{1}{2}\right) \mathbf{a}_1 + x_3 \mathbf{a}_2 -$	$=$	$-a\left(x_3 - \frac{1}{2}\right) \hat{\mathbf{x}} + ax_3 \hat{\mathbf{y}} - a\left(x_3 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(8e)	Cd III
	$\left(x_3 - \frac{1}{2}\right) \mathbf{a}_3$				
$\mathbf{B}_{16} =$	$x_3 \mathbf{a}_1 - \left(x_3 - \frac{1}{2}\right) \mathbf{a}_2 - \left(x_3 - \frac{1}{2}\right) \mathbf{a}_3$	$=$	$ax_3 \hat{\mathbf{x}} - a\left(x_3 - \frac{1}{2}\right) \hat{\mathbf{y}} - a\left(x_3 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(8e)	Cd III
$\mathbf{B}_{17} =$	$-x_3 \mathbf{a}_1 - x_3 \mathbf{a}_2 - x_3 \mathbf{a}_3$	$=$	$-ax_3 \hat{\mathbf{x}} - ax_3 \hat{\mathbf{y}} - ax_3 \hat{\mathbf{z}}$	(8e)	Cd III
$\mathbf{B}_{18} =$	$\left(x_3 + \frac{1}{2}\right) \mathbf{a}_1 + \left(x_3 + \frac{1}{2}\right) \mathbf{a}_2 - x_3 \mathbf{a}_3$	$=$	$a\left(x_3 + \frac{1}{2}\right) \hat{\mathbf{x}} + a\left(x_3 + \frac{1}{2}\right) \hat{\mathbf{y}} - ax_3 \hat{\mathbf{z}}$	(8e)	Cd III
$\mathbf{B}_{19} =$	$\left(x_3 + \frac{1}{2}\right) \mathbf{a}_1 - x_3 \mathbf{a}_2 + \left(x_3 + \frac{1}{2}\right) \mathbf{a}_3$	$=$	$a\left(x_3 + \frac{1}{2}\right) \hat{\mathbf{x}} - ax_3 \hat{\mathbf{y}} + a\left(x_3 + \frac{1}{2}\right) \hat{\mathbf{z}}$	(8e)	Cd III
$\mathbf{B}_{20} =$	$-x_3 \mathbf{a}_1 + \left(x_3 + \frac{1}{2}\right) \mathbf{a}_2 +$	$=$	$-ax_3 \hat{\mathbf{x}} + a\left(x_3 + \frac{1}{2}\right) \hat{\mathbf{y}} + a\left(x_3 + \frac{1}{2}\right) \hat{\mathbf{z}}$	(8e)	Cd III
	$\left(x_3 + \frac{1}{2}\right) \mathbf{a}_3$				
$\mathbf{B}_{21} =$	$x_4 \mathbf{a}_1 + \frac{1}{4} \mathbf{a}_2 + \frac{1}{4} \mathbf{a}_3$	$=$	$ax_4 \hat{\mathbf{x}} + \frac{1}{4} a \hat{\mathbf{y}} + \frac{1}{4} a \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{22} =$	$-\left(x_4 - \frac{1}{2}\right) \mathbf{a}_1 + \frac{1}{4} \mathbf{a}_2 + \frac{1}{4} \mathbf{a}_3$	$=$	$-a\left(x_4 - \frac{1}{2}\right) \hat{\mathbf{x}} + \frac{1}{4} a \hat{\mathbf{y}} + \frac{1}{4} a \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{23} =$	$\frac{1}{4} \mathbf{a}_1 + x_4 \mathbf{a}_2 + \frac{1}{4} \mathbf{a}_3$	$=$	$\frac{1}{4} a \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} + \frac{1}{4} a \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{24} =$	$\frac{1}{4} \mathbf{a}_1 - \left(x_4 - \frac{1}{2}\right) \mathbf{a}_2 + \frac{1}{4} \mathbf{a}_3$	$=$	$\frac{1}{4} a \hat{\mathbf{x}} - a\left(x_4 - \frac{1}{2}\right) \hat{\mathbf{y}} + \frac{1}{4} a \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{25} =$	$\frac{1}{4} \mathbf{a}_1 + \frac{1}{4} \mathbf{a}_2 + x_4 \mathbf{a}_3$	$=$	$\frac{1}{4} a \hat{\mathbf{x}} + \frac{1}{4} a \hat{\mathbf{y}} + ax_4 \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{26} =$	$\frac{1}{4} \mathbf{a}_1 + \frac{1}{4} \mathbf{a}_2 - \left(x_4 - \frac{1}{2}\right) \mathbf{a}_3$	$=$	$\frac{1}{4} a \hat{\mathbf{x}} + \frac{1}{4} a \hat{\mathbf{y}} - a\left(x_4 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{27} =$	$-x_4 \mathbf{a}_1 + \frac{3}{4} \mathbf{a}_2 + \frac{3}{4} \mathbf{a}_3$	$=$	$-ax_4 \hat{\mathbf{x}} + \frac{3}{4} a \hat{\mathbf{y}} + \frac{3}{4} a \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{28} =$	$\left(x_4 + \frac{1}{2}\right) \mathbf{a}_1 + \frac{3}{4} \mathbf{a}_2 + \frac{3}{4} \mathbf{a}_3$	$=$	$a\left(x_4 + \frac{1}{2}\right) \hat{\mathbf{x}} + \frac{3}{4} a \hat{\mathbf{y}} + \frac{3}{4} a \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{29} =$	$\frac{3}{4} \mathbf{a}_1 - x_4 \mathbf{a}_2 + \frac{3}{4} \mathbf{a}_3$	$=$	$\frac{3}{4} a \hat{\mathbf{x}} - ax_4 \hat{\mathbf{y}} + \frac{3}{4} a \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{30} =$	$\frac{3}{4} \mathbf{a}_1 + \left(x_4 + \frac{1}{2}\right) \mathbf{a}_2 + \frac{3}{4} \mathbf{a}_3$	$=$	$\frac{3}{4} a \hat{\mathbf{x}} + a\left(x_4 + \frac{1}{2}\right) \hat{\mathbf{y}} + \frac{3}{4} a \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{31} =$	$\frac{3}{4} \mathbf{a}_1 + \frac{3}{4} \mathbf{a}_2 - x_4 \mathbf{a}_3$	$=$	$\frac{3}{4} a \hat{\mathbf{x}} + \frac{3}{4} a \hat{\mathbf{y}} - ax_4 \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{32} =$	$\frac{3}{4} \mathbf{a}_1 + \frac{3}{4} \mathbf{a}_2 + \left(x_4 + \frac{1}{2}\right) \mathbf{a}_3$	$=$	$\frac{3}{4} a \hat{\mathbf{x}} + \frac{3}{4} a \hat{\mathbf{y}} + a\left(x_4 + \frac{1}{2}\right) \hat{\mathbf{z}}$	(12f)	Cd IV
$\mathbf{B}_{33} =$	$x_5 \mathbf{a}_1 + \frac{3}{4} \mathbf{a}_2 + \frac{1}{4} \mathbf{a}_3$	$=$	$ax_5 \hat{\mathbf{x}} + \frac{3}{4} a \hat{\mathbf{y}} + \frac{1}{4} a \hat{\mathbf{z}}$	(12g)	Cd V
$\mathbf{B}_{34} =$	$-\left(x_5 - \frac{1}{2}\right) \mathbf{a}_1 + \frac{3}{4} \mathbf{a}_2 + \frac{1}{4} \mathbf{a}_3$	$=$	$-a\left(x_5 - \frac{1}{2}\right) \hat{\mathbf{x}} + \frac{3}{4} a \hat{\mathbf{y}} + \frac{1}{4} a \hat{\mathbf{z}}$	(12g)	Cd V
$\mathbf{B}_{35} =$	$\frac{1}{4} \mathbf{a}_1 + x_5 \mathbf{a}_2 + \frac{3}{4} \mathbf{a}_3$	$=$	$\frac{1}{4} a \hat{\mathbf{x}} + ax_5 \hat{\mathbf{y}} + \frac{3}{4} a \hat{\mathbf{z}}$	(12g)	Cd V
$\mathbf{B}_{36} =$	$\frac{1}{4} \mathbf{a}_1 - \left(x_5 - \frac{1}{2}\right) \mathbf{a}_2 + \frac{3}{4} \mathbf{a}_3$	$=$	$\frac{1}{4} a \hat{\mathbf{x}} - a\left(x_5 - \frac{1}{2}\right) \hat{\mathbf{y}} + \frac{3}{4} a \hat{\mathbf{z}}$	(12g)	Cd V
$\mathbf{B}_{37} =$	$\frac{3}{4} \mathbf{a}_1 + \frac{1}{4} \mathbf{a}_2 + x_5 \mathbf{a}_3$	$=$	$\frac{3}{4} a \hat{\mathbf{x}} + \frac{1}{4} a \hat{\mathbf{y}} + ax_5 \hat{\mathbf{z}}$	(12g)	Cd V
$\mathbf{B}_{38} =$	$\frac{3}{4} \mathbf{a}_1 + \frac{1}{4} \mathbf{a}_2 - \left(x_5 - \frac{1}{2}\right) \mathbf{a}_3$	$=$	$\frac{3}{4} a \hat{\mathbf{x}} + \frac{1}{4} a \hat{\mathbf{y}} - a\left(x_5 - \frac{1}{2}\right) \hat{\mathbf{z}}$	(12g)	Cd V
$\mathbf{B}_{39} =$	$-x_5 \mathbf{a}_1 + \frac{1}{4} \mathbf{a}_2 + \frac{3}{4} \mathbf{a}_3$	$=$	$-ax_5 \hat{\mathbf{x}} + \frac{1}{4} a \hat{\mathbf{y}} + \frac{3}{4}$		

$\mathbf{B}_{52} =$	$-(z_6 - \frac{1}{2}) \mathbf{a}_1 + x_6 \mathbf{a}_2 -$	$=$	$-a(z_6 - \frac{1}{2}) \hat{\mathbf{x}} + ax_6 \hat{\mathbf{y}} - a(y_6 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VI
	$(y_6 - \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{53} =$	$y_6 \mathbf{a}_1 + z_6 \mathbf{a}_2 + x_6 \mathbf{a}_3$	$=$	$ay_6 \hat{\mathbf{x}} + az_6 \hat{\mathbf{y}} + ax_6 \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{54} =$	$-(y_6 - \frac{1}{2}) \mathbf{a}_1 + z_6 \mathbf{a}_2 -$	$=$	$-a(y_6 - \frac{1}{2}) \hat{\mathbf{x}} + az_6 \hat{\mathbf{y}} - a(x_6 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VI
	$(x_6 - \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{55} =$	$y_6 \mathbf{a}_1 - (z_6 - \frac{1}{2}) \mathbf{a}_2 - (x_6 - \frac{1}{2}) \mathbf{a}_3$	$=$	$ay_6 \hat{\mathbf{x}} - a(z_6 - \frac{1}{2}) \hat{\mathbf{y}} - a(x_6 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{56} =$	$-(y_6 - \frac{1}{2}) \mathbf{a}_1 - (z_6 - \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-a(y_6 - \frac{1}{2}) \hat{\mathbf{x}} - a(z_6 - \frac{1}{2}) \hat{\mathbf{y}} + ax_6 \hat{\mathbf{z}}$	(24h)	Cd VI
	$x_6 \mathbf{a}_3$				
$\mathbf{B}_{57} =$	$-x_6 \mathbf{a}_1 - y_6 \mathbf{a}_2 - z_6 \mathbf{a}_3$	$=$	$-ax_6 \hat{\mathbf{x}} - ay_6 \hat{\mathbf{y}} - az_6 \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{58} =$	$(x_6 + \frac{1}{2}) \mathbf{a}_1 + (y_6 + \frac{1}{2}) \mathbf{a}_2 - z_6 \mathbf{a}_3$	$=$	$a(x_6 + \frac{1}{2}) \hat{\mathbf{x}} + a(y_6 + \frac{1}{2}) \hat{\mathbf{y}} - az_6 \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{59} =$	$(x_6 + \frac{1}{2}) \mathbf{a}_1 - y_6 \mathbf{a}_2 + (z_6 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(x_6 + \frac{1}{2}) \hat{\mathbf{x}} - ay_6 \hat{\mathbf{y}} + a(z_6 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{60} =$	$-x_6 \mathbf{a}_1 + (y_6 + \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-ax_6 \hat{\mathbf{x}} + a(y_6 + \frac{1}{2}) \hat{\mathbf{y}} + a(z_6 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VI
	$(z_6 + \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{61} =$	$-z_6 \mathbf{a}_1 - x_6 \mathbf{a}_2 - y_6 \mathbf{a}_3$	$=$	$-az_6 \hat{\mathbf{x}} - ax_6 \hat{\mathbf{y}} - ay_6 \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{62} =$	$-z_6 \mathbf{a}_1 + (x_6 + \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-az_6 \hat{\mathbf{x}} + a(x_6 + \frac{1}{2}) \hat{\mathbf{y}} + a(y_6 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VI
	$(y_6 + \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{63} =$	$(z_6 + \frac{1}{2}) \mathbf{a}_1 + (x_6 + \frac{1}{2}) \mathbf{a}_2 - y_6 \mathbf{a}_3$	$=$	$a(z_6 + \frac{1}{2}) \hat{\mathbf{x}} + a(x_6 + \frac{1}{2}) \hat{\mathbf{y}} - ay_6 \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{64} =$	$(z_6 + \frac{1}{2}) \mathbf{a}_1 - x_6 \mathbf{a}_2 + (y_6 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(z_6 + \frac{1}{2}) \hat{\mathbf{x}} - ax_6 \hat{\mathbf{y}} + a(y_6 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{65} =$	$-y_6 \mathbf{a}_1 - z_6 \mathbf{a}_2 - x_6 \mathbf{a}_3$	$=$	$-ay_6 \hat{\mathbf{x}} - az_6 \hat{\mathbf{y}} - ax_6 \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{66} =$	$(y_6 + \frac{1}{2}) \mathbf{a}_1 - z_6 \mathbf{a}_2 + (x_6 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(y_6 + \frac{1}{2}) \hat{\mathbf{x}} - az_6 \hat{\mathbf{y}} + a(x_6 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{67} =$	$-y_6 \mathbf{a}_1 + (z_6 + \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-ay_6 \hat{\mathbf{x}} + a(z_6 + \frac{1}{2}) \hat{\mathbf{y}} + a(x_6 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VI
	$(x_6 + \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{68} =$	$(y_6 + \frac{1}{2}) \mathbf{a}_1 + (z_6 + \frac{1}{2}) \mathbf{a}_2 - x_6 \mathbf{a}_3$	$=$	$a(y_6 + \frac{1}{2}) \hat{\mathbf{x}} + a(z_6 + \frac{1}{2}) \hat{\mathbf{y}} - ax_6 \hat{\mathbf{z}}$	(24h)	Cd VI
$\mathbf{B}_{69} =$	$x_7 \mathbf{a}_1 + y_7 \mathbf{a}_2 + z_7 \mathbf{a}_3$	$=$	$ax_7 \hat{\mathbf{x}} + ay_7 \hat{\mathbf{y}} + az_7 \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{70} =$	$-(x_7 - \frac{1}{2}) \mathbf{a}_1 - (y_7 - \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-a(x_7 - \frac{1}{2}) \hat{\mathbf{x}} - a(y_7 - \frac{1}{2}) \hat{\mathbf{y}} + az_7 \hat{\mathbf{z}}$	(24h)	Cd VII
	$z_7 \mathbf{a}_3$				
$\mathbf{B}_{71} =$	$-(x_7 - \frac{1}{2}) \mathbf{a}_1 + y_7 \mathbf{a}_2 -$	$=$	$-a(x_7 - \frac{1}{2}) \hat{\mathbf{x}} + ay_7 \hat{\mathbf{y}} - a(z_7 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
	$(z_7 - \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{72} =$	$x_7 \mathbf{a}_1 - (y_7 - \frac{1}{2}) \mathbf{a}_2 - (z_7 - \frac{1}{2}) \mathbf{a}_3$	$=$	$ax_7 \hat{\mathbf{x}} - a(y_7 - \frac{1}{2}) \hat{\mathbf{y}} - a(z_7 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{73} =$	$z_7 \mathbf{a}_1 + x_7 \mathbf{a}_2 + y_7 \mathbf{a}_3$	$=$	$az_7 \hat{\mathbf{x}} + ax_7 \hat{\mathbf{y}} + ay_7 \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{74} =$	$z_7 \mathbf{a}_1 - (x_7 - \frac{1}{2}) \mathbf{a}_2 - (y_7 - \frac{1}{2}) \mathbf{a}_3$	$=$	$az_7 \hat{\mathbf{x}} - a(x_7 - \frac{1}{2}) \hat{\mathbf{y}} - a(y_7 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{75} =$	$-(z_7 - \frac{1}{2}) \mathbf{a}_1 - (x_7 - \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-a(z_7 - \frac{1}{2}) \hat{\mathbf{x}} - a(x_7 - \frac{1}{2}) \hat{\mathbf{y}} + ay_7 \hat{\mathbf{z}}$	(24h)	Cd VII
	$y_7 \mathbf{a}_3$				
$\mathbf{B}_{76} =$	$-(z_7 - \frac{1}{2}) \mathbf{a}_1 + x_7 \mathbf{a}_2 -$	$=$	$-a(z_7 - \frac{1}{2}) \hat{\mathbf{x}} + ax_7 \hat{\mathbf{y}} - a(y_7 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
	$(y_7 - \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{77} =$	$y_7 \mathbf{a}_1 + z_7 \mathbf{a}_2 + x_7 \mathbf{a}_3$	$=$	$ay_7 \hat{\mathbf{x}} + az_7 \hat{\mathbf{y}} + ax_7 \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{78} =$	$-(y_7 - \frac{1}{2}) \mathbf{a}_1 + z_7 \mathbf{a}_2 -$	$=$	$-a(y_7 - \frac{1}{2}) \hat{\mathbf{x}} + az_7 \hat{\mathbf{y}} - a(x_7 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
	$(x_7 - \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{79} =$	$y_7 \mathbf{a}_1 - (z_7 - \frac{1}{2}) \mathbf{a}_2 - (x_7 - \frac{1}{2}) \mathbf{a}_3$	$=$	$ay_7 \hat{\mathbf{x}} - a(z_7 - \frac{1}{2}) \hat{\mathbf{y}} - a(x_7 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{80} =$	$-(y_7 - \frac{1}{2}) \mathbf{a}_1 - (z_7 - \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-a(y_7 - \frac{1}{2}) \hat{\mathbf{x}} - a(z_7 - \frac{1}{2}) \hat{\mathbf{y}} + ax_7 \hat{\mathbf{z}}$	(24h)	Cd VII
	$x_7 \mathbf{a}_3$				
$\mathbf{B}_{81} =$	$-x_7 \mathbf{a}_1 - y_7 \mathbf{a}_2 - z_7 \mathbf{a}_3$	$=$	$-ax_7 \hat{\mathbf{x}} - ay_7 \hat{\mathbf{y}} - az_7 \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{82} =$	$(x_7 + \frac{1}{2}) \mathbf{a}_1 + (y_7 + \frac{1}{2}) \mathbf{a}_2 - z_7 \mathbf{a}_3$	$=$	$a(x_7 + \frac{1}{2}) \hat{\mathbf{x}} + a(y_7 + \frac{1}{2}) \hat{\mathbf{y}} - az_7 \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{83} =$	$(x_7 + \frac{1}{2}) \mathbf{a}_1 - y_7 \mathbf{a}_2 + (z_7 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(x_7 + \frac{1}{2}) \hat{\mathbf{x}} - ay_7 \hat{\mathbf{y}} + a(z_7 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII

$\mathbf{B}_{84} =$	$-x_7 \mathbf{a}_1 + (y_7 + \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-ax_7 \hat{\mathbf{x}} + a(y_7 + \frac{1}{2}) \hat{\mathbf{y}} + a(z_7 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
	$(z_7 + \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{85} =$	$-z_7 \mathbf{a}_1 - x_7 \mathbf{a}_2 - y_7 \mathbf{a}_3$	$=$	$-az_7 \hat{\mathbf{x}} - ax_7 \hat{\mathbf{y}} - ay_7 \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{86} =$	$-z_7 \mathbf{a}_1 + (x_7 + \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-az_7 \hat{\mathbf{x}} + a(x_7 + \frac{1}{2}) \hat{\mathbf{y}} + a(y_7 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
	$(y_7 + \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{87} =$	$(z_7 + \frac{1}{2}) \mathbf{a}_1 + (x_7 + \frac{1}{2}) \mathbf{a}_2 - y_7 \mathbf{a}_3$	$=$	$a(z_7 + \frac{1}{2}) \hat{\mathbf{x}} + a(x_7 + \frac{1}{2}) \hat{\mathbf{y}} - ay_7 \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{88} =$	$(z_7 + \frac{1}{2}) \mathbf{a}_1 - x_7 \mathbf{a}_2 + (y_7 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(z_7 + \frac{1}{2}) \hat{\mathbf{x}} - ax_7 \hat{\mathbf{y}} + a(y_7 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{89} =$	$-y_7 \mathbf{a}_1 - z_7 \mathbf{a}_2 - x_7 \mathbf{a}_3$	$=$	$-ay_7 \hat{\mathbf{x}} - az_7 \hat{\mathbf{y}} - ax_7 \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{90} =$	$(y_7 + \frac{1}{2}) \mathbf{a}_1 - z_7 \mathbf{a}_2 + (x_7 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(y_7 + \frac{1}{2}) \hat{\mathbf{x}} - az_7 \hat{\mathbf{y}} + a(x_7 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{91} =$	$-y_7 \mathbf{a}_1 + (z_7 + \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-ay_7 \hat{\mathbf{x}} + a(z_7 + \frac{1}{2}) \hat{\mathbf{y}} + a(x_7 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VII
	$(x_7 + \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{92} =$	$(y_7 + \frac{1}{2}) \mathbf{a}_1 + (z_7 + \frac{1}{2}) \mathbf{a}_2 - x_7 \mathbf{a}_3$	$=$	$a(y_7 + \frac{1}{2}) \hat{\mathbf{x}} + a(z_7 + \frac{1}{2}) \hat{\mathbf{y}} - ax_7 \hat{\mathbf{z}}$	(24h)	Cd VII
$\mathbf{B}_{93} =$	$x_8 \mathbf{a}_1 + y_8 \mathbf{a}_2 + z_8 \mathbf{a}_3$	$=$	$ax_8 \hat{\mathbf{x}} + ay_8 \hat{\mathbf{y}} + az_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{94} =$	$-(x_8 - \frac{1}{2}) \mathbf{a}_1 - (y_8 - \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-a(x_8 - \frac{1}{2}) \hat{\mathbf{x}} - a(y_8 - \frac{1}{2}) \hat{\mathbf{y}} + az_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
	$z_8 \mathbf{a}_3$				
$\mathbf{B}_{95} =$	$-(x_8 - \frac{1}{2}) \mathbf{a}_1 + y_8 \mathbf{a}_2 -$	$=$	$-a(x_8 - \frac{1}{2}) \hat{\mathbf{x}} + ay_8 \hat{\mathbf{y}} - a(z_8 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
	$(z_8 - \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{96} =$	$x_8 \mathbf{a}_1 - (y_8 - \frac{1}{2}) \mathbf{a}_2 - (z_8 - \frac{1}{2}) \mathbf{a}_3$	$=$	$ax_8 \hat{\mathbf{x}} - a(y_8 - \frac{1}{2}) \hat{\mathbf{y}} - a(z_8 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{97} =$	$z_8 \mathbf{a}_1 + x_8 \mathbf{a}_2 + y_8 \mathbf{a}_3$	$=$	$az_8 \hat{\mathbf{x}} + ax_8 \hat{\mathbf{y}} + ay_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{98} =$	$z_8 \mathbf{a}_1 - (x_8 - \frac{1}{2}) \mathbf{a}_2 - (y_8 - \frac{1}{2}) \mathbf{a}_3$	$=$	$az_8 \hat{\mathbf{x}} - a(x_8 - \frac{1}{2}) \hat{\mathbf{y}} - a(y_8 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{99} =$	$-(z_8 - \frac{1}{2}) \mathbf{a}_1 - (x_8 - \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-a(z_8 - \frac{1}{2}) \hat{\mathbf{x}} - a(x_8 - \frac{1}{2}) \hat{\mathbf{y}} + ay_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
	$y_8 \mathbf{a}_3$				
$\mathbf{B}_{100} =$	$-(z_8 - \frac{1}{2}) \mathbf{a}_1 + x_8 \mathbf{a}_2 -$	$=$	$-a(z_8 - \frac{1}{2}) \hat{\mathbf{x}} + ax_8 \hat{\mathbf{y}} - a(y_8 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
	$(y_8 - \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{101} =$	$y_8 \mathbf{a}_1 + z_8 \mathbf{a}_2 + x_8 \mathbf{a}_3$	$=$	$ay_8 \hat{\mathbf{x}} + az_8 \hat{\mathbf{y}} + ax_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{102} =$	$-(y_8 - \frac{1}{2}) \mathbf{a}_1 + z_8 \mathbf{a}_2 -$	$=$	$-a(y_8 - \frac{1}{2}) \hat{\mathbf{x}} + az_8 \hat{\mathbf{y}} - a(x_8 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
	$(x_8 - \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{103} =$	$y_8 \mathbf{a}_1 - (z_8 - \frac{1}{2}) \mathbf{a}_2 - (x_8 - \frac{1}{2}) \mathbf{a}_3$	$=$	$ay_8 \hat{\mathbf{x}} - a(z_8 - \frac{1}{2}) \hat{\mathbf{y}} - a(x_8 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{104} =$	$-(y_8 - \frac{1}{2}) \mathbf{a}_1 - (z_8 - \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-a(y_8 - \frac{1}{2}) \hat{\mathbf{x}} - a(z_8 - \frac{1}{2}) \hat{\mathbf{y}} + ax_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
	$x_8 \mathbf{a}_3$				
$\mathbf{B}_{105} =$	$-x_8 \mathbf{a}_1 - y_8 \mathbf{a}_2 - z_8 \mathbf{a}_3$	$=$	$-ax_8 \hat{\mathbf{x}} - ay_8 \hat{\mathbf{y}} - az_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{106} =$	$(x_8 + \frac{1}{2}) \mathbf{a}_1 + (y_8 + \frac{1}{2}) \mathbf{a}_2 - z_8 \mathbf{a}_3$	$=$	$a(x_8 + \frac{1}{2}) \hat{\mathbf{x}} + a(y_8 + \frac{1}{2}) \hat{\mathbf{y}} - az_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{107} =$	$(x_8 + \frac{1}{2}) \mathbf{a}_1 - y_8 \mathbf{a}_2 + (z_8 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(x_8 + \frac{1}{2}) \hat{\mathbf{x}} - ay_8 \hat{\mathbf{y}} + a(z_8 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{108} =$	$-x_8 \mathbf{a}_1 + (y_8 + \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-ax_8 \hat{\mathbf{x}} + a(y_8 + \frac{1}{2}) \hat{\mathbf{y}} + a(z_8 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
	$(z_8 + \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{109} =$	$-z_8 \mathbf{a}_1 - x_8 \mathbf{a}_2 - y_8 \mathbf{a}_3$	$=$	$-az_8 \hat{\mathbf{x}} - ax_8 \hat{\mathbf{y}} - ay_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{110} =$	$-z_8 \mathbf{a}_1 + (x_8 + \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-az_8 \hat{\mathbf{x}} + a(x_8 + \frac{1}{2}) \hat{\mathbf{y}} + a(y_8 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
	$(y_8 + \frac{1}{2}) \mathbf{a}_3$				
$\mathbf{B}_{111} =$	$(z_8 + \frac{1}{2}) \mathbf{a}_1 + (x_8 + \frac{1}{2}) \mathbf{a}_2 - y_8 \mathbf{a}_3$	$=$	$a(z_8 + \frac{1}{2}) \hat{\mathbf{x}} + a(x_8 + \frac{1}{2}) \hat{\mathbf{y}} - ay_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{112} =$	$(z_8 + \frac{1}{2}) \mathbf{a}_1 - x_8 \mathbf{a}_2 + (y_8 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(z_8 + \frac{1}{2}) \hat{\mathbf{x}} - ax_8 \hat{\mathbf{y}} + a(y_8 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{113} =$	$-y_8 \mathbf{a}_1 - z_8 \mathbf{a}_2 - x_8 \mathbf{a}_3$	$=$	$-ay_8 \hat{\mathbf{x}} - az_8 \hat{\mathbf{y}} - ax_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{114} =$	$(y_8 + \frac{1}{2}) \mathbf{a}_1 - z_8 \mathbf{a}_2 + (x_8 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(y_8 + \frac{1}{2}) \hat{\mathbf{x}} - az_8 \hat{\mathbf{y}} + a(x_8 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{115} =$	$-y_8 \mathbf{a}_1 + (z_8 + \frac{1}{2}) \mathbf{a}_2 +$	$=$	$-ay_8 \hat{\mathbf{x}} + a(z_8 + \frac{1}{2}) \hat{\mathbf{y}} + a(x_8 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd VIII
	$(x_8 + \frac{1}{2}) \mathbf{a}_3$				

$\mathbf{B}_{116} =$	$(y_8 + \frac{1}{2}) \mathbf{a}_1 + (z_8 + \frac{1}{2}) \mathbf{a}_2 - x_8 \mathbf{a}_3$	$=$	$a(y_8 + \frac{1}{2}) \hat{\mathbf{x}} + a(z_8 + \frac{1}{2}) \hat{\mathbf{y}} - ax_8 \hat{\mathbf{z}}$	(24h)	Cd VIII
$\mathbf{B}_{117} =$	$x_9 \mathbf{a}_1 + y_9 \mathbf{a}_2 + z_9 \mathbf{a}_3$	$=$	$ax_9 \hat{\mathbf{x}} + ay_9 \hat{\mathbf{y}} + az_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{118} =$	$-(x_9 - \frac{1}{2}) \mathbf{a}_1 - (y_9 - \frac{1}{2}) \mathbf{a}_2 + z_9 \mathbf{a}_3$	$=$	$-a(x_9 - \frac{1}{2}) \hat{\mathbf{x}} - a(y_9 - \frac{1}{2}) \hat{\mathbf{y}} + az_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{119} =$	$-(x_9 - \frac{1}{2}) \mathbf{a}_1 + y_9 \mathbf{a}_2 - (z_9 - \frac{1}{2}) \mathbf{a}_3$	$=$	$-a(x_9 - \frac{1}{2}) \hat{\mathbf{x}} + ay_9 \hat{\mathbf{y}} - a(z_9 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{120} =$	$x_9 \mathbf{a}_1 - (y_9 - \frac{1}{2}) \mathbf{a}_2 - (z_9 - \frac{1}{2}) \mathbf{a}_3$	$=$	$ax_9 \hat{\mathbf{x}} - a(y_9 - \frac{1}{2}) \hat{\mathbf{y}} - a(z_9 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{121} =$	$z_9 \mathbf{a}_1 + x_9 \mathbf{a}_2 + y_9 \mathbf{a}_3$	$=$	$az_9 \hat{\mathbf{x}} + ax_9 \hat{\mathbf{y}} + ay_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{122} =$	$z_9 \mathbf{a}_1 - (x_9 - \frac{1}{2}) \mathbf{a}_2 - (y_9 - \frac{1}{2}) \mathbf{a}_3$	$=$	$az_9 \hat{\mathbf{x}} - a(x_9 - \frac{1}{2}) \hat{\mathbf{y}} - a(y_9 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{123} =$	$-(z_9 - \frac{1}{2}) \mathbf{a}_1 - (x_9 - \frac{1}{2}) \mathbf{a}_2 + y_9 \mathbf{a}_3$	$=$	$-a(z_9 - \frac{1}{2}) \hat{\mathbf{x}} - a(x_9 - \frac{1}{2}) \hat{\mathbf{y}} + ay_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{124} =$	$-(z_9 - \frac{1}{2}) \mathbf{a}_1 + x_9 \mathbf{a}_2 - (y_9 - \frac{1}{2}) \mathbf{a}_3$	$=$	$-a(z_9 - \frac{1}{2}) \hat{\mathbf{x}} + ax_9 \hat{\mathbf{y}} - a(y_9 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{125} =$	$y_9 \mathbf{a}_1 + z_9 \mathbf{a}_2 + x_9 \mathbf{a}_3$	$=$	$ay_9 \hat{\mathbf{x}} + az_9 \hat{\mathbf{y}} + ax_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{126} =$	$-(y_9 - \frac{1}{2}) \mathbf{a}_1 + z_9 \mathbf{a}_2 - (x_9 - \frac{1}{2}) \mathbf{a}_3$	$=$	$-a(y_9 - \frac{1}{2}) \hat{\mathbf{x}} + az_9 \hat{\mathbf{y}} - a(x_9 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{127} =$	$y_9 \mathbf{a}_1 - (z_9 - \frac{1}{2}) \mathbf{a}_2 - (x_9 - \frac{1}{2}) \mathbf{a}_3$	$=$	$ay_9 \hat{\mathbf{x}} - a(z_9 - \frac{1}{2}) \hat{\mathbf{y}} - a(x_9 - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{128} =$	$-(y_9 - \frac{1}{2}) \mathbf{a}_1 - (z_9 - \frac{1}{2}) \mathbf{a}_2 + x_9 \mathbf{a}_3$	$=$	$-a(y_9 - \frac{1}{2}) \hat{\mathbf{x}} - a(z_9 - \frac{1}{2}) \hat{\mathbf{y}} + ax_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{129} =$	$-x_9 \mathbf{a}_1 - y_9 \mathbf{a}_2 - z_9 \mathbf{a}_3$	$=$	$-ax_9 \hat{\mathbf{x}} - ay_9 \hat{\mathbf{y}} - az_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{130} =$	$(x_9 + \frac{1}{2}) \mathbf{a}_1 + (y_9 + \frac{1}{2}) \mathbf{a}_2 - z_9 \mathbf{a}_3$	$=$	$a(x_9 + \frac{1}{2}) \hat{\mathbf{x}} + a(y_9 + \frac{1}{2}) \hat{\mathbf{y}} - az_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{131} =$	$(x_9 + \frac{1}{2}) \mathbf{a}_1 - y_9 \mathbf{a}_2 + (z_9 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(x_9 + \frac{1}{2}) \hat{\mathbf{x}} - ay_9 \hat{\mathbf{y}} + a(z_9 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{132} =$	$-x_9 \mathbf{a}_1 + (y_9 + \frac{1}{2}) \mathbf{a}_2 + (z_9 + \frac{1}{2}) \mathbf{a}_3$	$=$	$-ax_9 \hat{\mathbf{x}} + a(y_9 + \frac{1}{2}) \hat{\mathbf{y}} + a(z_9 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{133} =$	$-z_9 \mathbf{a}_1 - x_9 \mathbf{a}_2 - y_9 \mathbf{a}_3$	$=$	$-az_9 \hat{\mathbf{x}} - ax_9 \hat{\mathbf{y}} - ay_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{134} =$	$-z_9 \mathbf{a}_1 + (x_9 + \frac{1}{2}) \mathbf{a}_2 + (y_9 + \frac{1}{2}) \mathbf{a}_3$	$=$	$-az_9 \hat{\mathbf{x}} + a(x_9 + \frac{1}{2}) \hat{\mathbf{y}} + a(y_9 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{135} =$	$(z_9 + \frac{1}{2}) \mathbf{a}_1 + (x_9 + \frac{1}{2}) \mathbf{a}_2 - y_9 \mathbf{a}_3$	$=$	$a(z_9 + \frac{1}{2}) \hat{\mathbf{x}} + a(x_9 + \frac{1}{2}) \hat{\mathbf{y}} - ay_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{136} =$	$(z_9 + \frac{1}{2}) \mathbf{a}_1 - x_9 \mathbf{a}_2 + (y_9 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(z_9 + \frac{1}{2}) \hat{\mathbf{x}} - ax_9 \hat{\mathbf{y}} + a(y_9 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{137} =$	$-y_9 \mathbf{a}_1 - z_9 \mathbf{a}_2 - x_9 \mathbf{a}_3$	$=$	$-ay_9 \hat{\mathbf{x}} - az_9 \hat{\mathbf{y}} - ax_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{138} =$	$(y_9 + \frac{1}{2}) \mathbf{a}_1 - z_9 \mathbf{a}_2 + (x_9 + \frac{1}{2}) \mathbf{a}_3$	$=$	$a(y_9 + \frac{1}{2}) \hat{\mathbf{x}} - az_9 \hat{\mathbf{y}} + a(x_9 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{139} =$	$-y_9 \mathbf{a}_1 + (z_9 + \frac{1}{2}) \mathbf{a}_2 + (x_9 + \frac{1}{2}) \mathbf{a}_3$	$=$	$-ay_9 \hat{\mathbf{x}} + a(z_9 + \frac{1}{2}) \hat{\mathbf{y}} + a(x_9 + \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{140} =$	$(y_9 + \frac{1}{2}) \mathbf{a}_1 + (z_9 + \frac{1}{2}) \mathbf{a}_2 - x_9 \mathbf{a}_3$	$=$	$a(y_9 + \frac{1}{2}) \hat{\mathbf{x}} + a(z_9 + \frac{1}{2}) \hat{\mathbf{y}} - ax_9 \hat{\mathbf{z}}$	(24h)	Cd IX
$\mathbf{B}_{141} =$	$x_{10} \mathbf{a}_1 + y_{10} \mathbf{a}_2 + z_{10} \mathbf{a}_3$	$=$	$ax_{10} \hat{\mathbf{x}} + ay_{10} \hat{\mathbf{y}} + az_{10} \hat{\mathbf{z}}$	(24h)	Cd X
$\mathbf{B}_{142} =$	$-(x_{10} - \frac{1}{2}) \mathbf{a}_1 - (y_{10} - \frac{1}{2}) \mathbf{a}_2 + z_{10} \mathbf{a}_3$	$=$	$-a(x_{10} - \frac{1}{2}) \hat{\mathbf{x}} - a(y_{10} - \frac{1}{2}) \hat{\mathbf{y}} + az_{10} \hat{\mathbf{z}}$	(24h)	Cd X
$\mathbf{B}_{143} =$	$-(x_{10} - \frac{1}{2}) \mathbf{a}_1 + y_{10} \mathbf{a}_2 - (z_{10} - \frac{1}{2}) \mathbf{a}_3$	$=$	$-a(x_{10} - \frac{1}{2}) \hat{\mathbf{x}} + ay_{10} \hat{\mathbf{y}} - a(z_{10} - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd X
$\mathbf{B}_{144} =$	$x_{10} \mathbf{a}_1 - (y_{10} - \frac{1}{2}) \mathbf{a}_2 - (z_{10} - \frac{1}{2}) \mathbf{a}_3$	$=$	$ax_{10} \hat{\mathbf{x}} - a(y_{10} - \frac{1}{2}) \hat{\mathbf{y}} - a(z_{10} - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd X
$\mathbf{B}_{145} =$	$z_{10} \mathbf{a}_1 + x_{10} \mathbf{a}_2 + y_{10} \mathbf{a}_3$	$=$	$az_{10} \hat{\mathbf{x}} + ax_{10} \hat{\mathbf{y}} + ay_{10} \hat{\mathbf{z}}$	(24h)	Cd X
$\mathbf{B}_{146} =$	$z_{10} \mathbf{a}_1 - (x_{10} - \frac{1}{2}) \mathbf{a}_2 - (y_{10} - \frac{1}{2}) \mathbf{a}_3$	$=$	$az_{10} \hat{\mathbf{x}} - a(x_{10} - \frac{1}{2}) \hat{\mathbf{y}} - a(y_{10} - \frac{1}{2}) \hat{\mathbf{z}}$	(24h)	Cd X

$$\begin{aligned}
\mathbf{B}_{173} &= y_{11} \mathbf{a}_1 + z_{11} \mathbf{a}_2 + x_{11} \mathbf{a}_3 &= ay_{11} \hat{\mathbf{x}} + az_{11} \hat{\mathbf{y}} + ax_{11} \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
\mathbf{B}_{174} &= -\left(y_{11} - \frac{1}{2}\right) \mathbf{a}_1 + z_{11} \mathbf{a}_2 - &= -a\left(y_{11} - \frac{1}{2}\right) \hat{\mathbf{x}} + az_{11} \hat{\mathbf{y}} - a\left(x_{11} - \frac{1}{2}\right) \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad \left(x_{11} - \frac{1}{2}\right) \mathbf{a}_3 \\
\mathbf{B}_{175} &= y_{11} \mathbf{a}_1 - \left(z_{11} - \frac{1}{2}\right) \mathbf{a}_2 - &= ay_{11} \hat{\mathbf{x}} - a\left(z_{11} - \frac{1}{2}\right) \hat{\mathbf{y}} - a\left(x_{11} - \frac{1}{2}\right) \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad \left(x_{11} - \frac{1}{2}\right) \mathbf{a}_3 \\
\mathbf{B}_{176} &= -\left(y_{11} - \frac{1}{2}\right) \mathbf{a}_1 - \left(z_{11} - \frac{1}{2}\right) \mathbf{a}_2 + &= -a\left(y_{11} - \frac{1}{2}\right) \hat{\mathbf{x}} - a\left(z_{11} - \frac{1}{2}\right) \hat{\mathbf{y}} + ax_{11} \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad x_{11} \mathbf{a}_3 \\
\mathbf{B}_{177} &= -x_{11} \mathbf{a}_1 - y_{11} \mathbf{a}_2 - z_{11} \mathbf{a}_3 &= -ax_{11} \hat{\mathbf{x}} - ay_{11} \hat{\mathbf{y}} - az_{11} \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
\mathbf{B}_{178} &= \left(x_{11} + \frac{1}{2}\right) \mathbf{a}_1 + \left(y_{11} + \frac{1}{2}\right) \mathbf{a}_2 - &= a\left(x_{11} + \frac{1}{2}\right) \hat{\mathbf{x}} + a\left(y_{11} + \frac{1}{2}\right) \hat{\mathbf{y}} - az_{11} \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad z_{11} \mathbf{a}_3 \\
\mathbf{B}_{179} &= \left(x_{11} + \frac{1}{2}\right) \mathbf{a}_1 - y_{11} \mathbf{a}_2 + &= a\left(x_{11} + \frac{1}{2}\right) \hat{\mathbf{x}} - ay_{11} \hat{\mathbf{y}} + a\left(z_{11} + \frac{1}{2}\right) \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad \left(z_{11} + \frac{1}{2}\right) \mathbf{a}_3 \\
\mathbf{B}_{180} &= -x_{11} \mathbf{a}_1 + \left(y_{11} + \frac{1}{2}\right) \mathbf{a}_2 + &= -ax_{11} \hat{\mathbf{x}} + a\left(y_{11} + \frac{1}{2}\right) \hat{\mathbf{y}} + a\left(z_{11} + \frac{1}{2}\right) \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad \left(z_{11} + \frac{1}{2}\right) \mathbf{a}_3 \\
\mathbf{B}_{181} &= -z_{11} \mathbf{a}_1 - x_{11} \mathbf{a}_2 - y_{11} \mathbf{a}_3 &= -az_{11} \hat{\mathbf{x}} - ax_{11} \hat{\mathbf{y}} - ay_{11} \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
\mathbf{B}_{182} &= -z_{11} \mathbf{a}_1 + \left(x_{11} + \frac{1}{2}\right) \mathbf{a}_2 + &= -az_{11} \hat{\mathbf{x}} + a\left(x_{11} + \frac{1}{2}\right) \hat{\mathbf{y}} + a\left(y_{11} + \frac{1}{2}\right) \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad \left(y_{11} + \frac{1}{2}\right) \mathbf{a}_3 \\
\mathbf{B}_{183} &= \left(z_{11} + \frac{1}{2}\right) \mathbf{a}_1 + \left(x_{11} + \frac{1}{2}\right) \mathbf{a}_2 - &= a\left(z_{11} + \frac{1}{2}\right) \hat{\mathbf{x}} + a\left(x_{11} + \frac{1}{2}\right) \hat{\mathbf{y}} - ay_{11} \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad y_{11} \mathbf{a}_3 \\
\mathbf{B}_{184} &= \left(z_{11} + \frac{1}{2}\right) \mathbf{a}_1 - x_{11} \mathbf{a}_2 + &= a\left(z_{11} + \frac{1}{2}\right) \hat{\mathbf{x}} - ax_{11} \hat{\mathbf{y}} + a\left(y_{11} + \frac{1}{2}\right) \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad \left(y_{11} + \frac{1}{2}\right) \mathbf{a}_3 \\
\mathbf{B}_{185} &= -y_{11} \mathbf{a}_1 - z_{11} \mathbf{a}_2 - x_{11} \mathbf{a}_3 &= -ay_{11} \hat{\mathbf{x}} - az_{11} \hat{\mathbf{y}} - ax_{11} \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
\mathbf{B}_{186} &= \left(y_{11} + \frac{1}{2}\right) \mathbf{a}_1 - z_{11} \mathbf{a}_2 + &= a\left(y_{11} + \frac{1}{2}\right) \hat{\mathbf{x}} - az_{11} \hat{\mathbf{y}} + a\left(x_{11} + \frac{1}{2}\right) \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad \left(x_{11} + \frac{1}{2}\right) \mathbf{a}_3 \\
\mathbf{B}_{187} &= -y_{11} \mathbf{a}_1 + \left(z_{11} + \frac{1}{2}\right) \mathbf{a}_2 + &= -ay_{11} \hat{\mathbf{x}} + a\left(z_{11} + \frac{1}{2}\right) \hat{\mathbf{y}} + a\left(x_{11} + \frac{1}{2}\right) \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad \left(x_{11} + \frac{1}{2}\right) \mathbf{a}_3 \\
\mathbf{B}_{188} &= \left(y_{11} + \frac{1}{2}\right) \mathbf{a}_1 + \left(z_{11} + \frac{1}{2}\right) \mathbf{a}_2 - &= a\left(y_{11} + \frac{1}{2}\right) \hat{\mathbf{x}} + a\left(z_{11} + \frac{1}{2}\right) \hat{\mathbf{y}} - ax_{11} \hat{\mathbf{z}} & (24h) & \text{Ce I} \\
&\quad x_{11} \mathbf{a}_3
\end{aligned}$$

References

- [1] M. Armbrüster and S. Lidin, *Reassessing the compound CeCd₆: the structure of Ce₆Cd₃₇*, J. Alloys Compd. **307**, 141–148 (2000), doi:10.1016/S0925-8388(00)00881-1.
- [2] A. C. Larson and D. T. Cromer, *The Crystal Structure of YCd₆*, Acta Crystallogr. Sect. B **27**, 1875–1879 (1971), doi:10.1107/S0567740871005028.

Found in

- [1] B. Skolyszewska-Kühberger, T. L. Reichmann, M. C. J. Marker, H. S. Effenberger, and H. Ipser, *Re-investigation of the Cd-Ce Phase Diagram and Structural Characterization of the High-Temperature Phase Cd_{17+2x}Ce_{2-x} ($x \sim 0.02$)*, J. Phase Equil. Diff. **37**, 186–199 (2016), doi:10.1007/s11669-015-0441-z.

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