

Sm₁₁Cd₄₅ Structure: A45B11_cF448_216_ac4efg5h_bd2eh-001

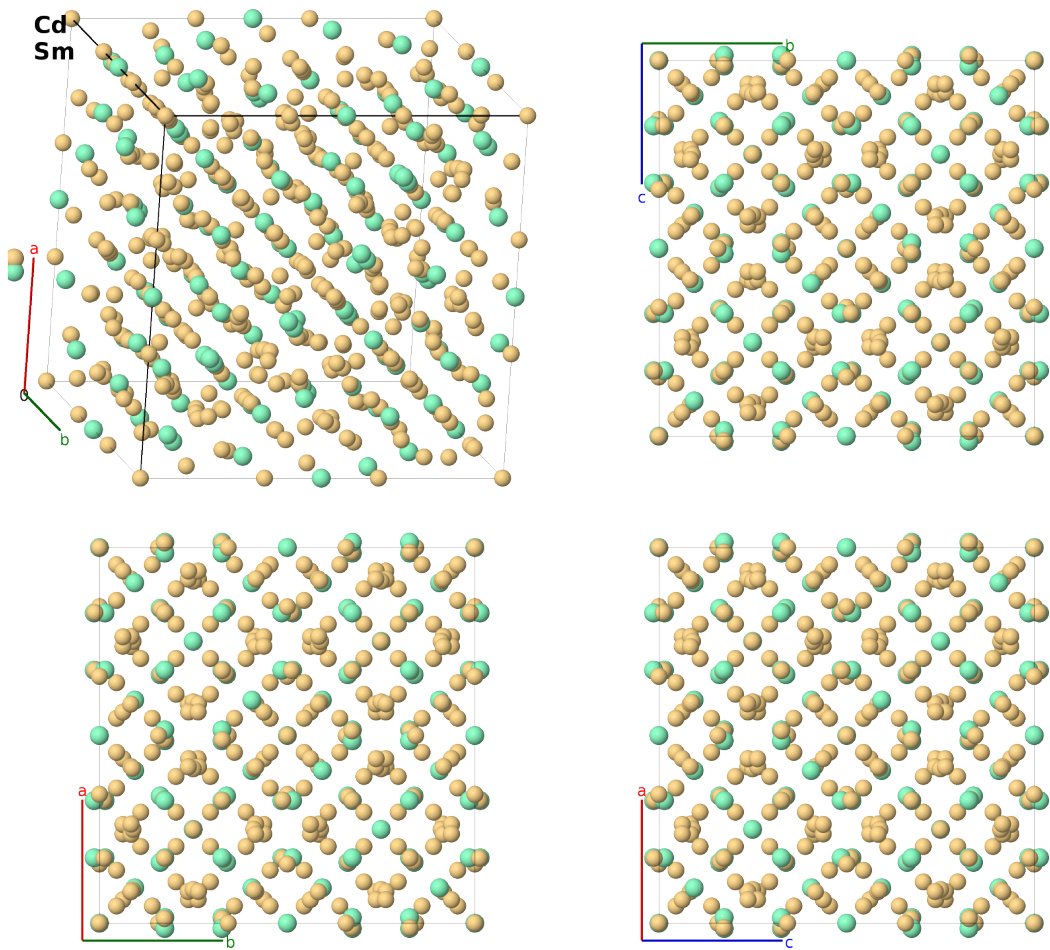
This structure previously used the label(s) **A45B11_cF448_216_bd4efg5h_ac2eh**. Calls to these addresses will be redirected here.

Cite this page as:

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- D. Hicks, M. J. Mehl, M. Esters, C. Oses, O. Levy, G. L. W. Hart, C. Toher, and S. Curtarolo, *The AFLOW Library of Crystallographic Prototypes: Part 3*, Comput. Mater. Sci. **199**, 110450 (2021), doi: 10.1016/j.commatsci.2021.110450.

<https://aflow.org/prototype-encyclopedia/LZ4J>

https://aflow.org/prototype-encyclopedia/A45B11_cF448_216_ac4efg5h_bd2eh-001



Prototype	Cd ₄₅ Sm ₁₁
AFLOW prototype label	A45B11_cF448_216_ac4efg5h_bd2eh-001
ICSD	2246
CCDC	1592160
Pearson symbol	cF448
Space group number	216

Space group symbol $F\bar{4}3m$

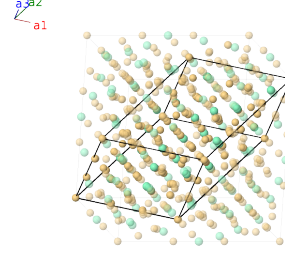
AFLOW prototype command `aflow --proto=A45B11_cF448_216_ac4efg5h_bd2eh-001`
`--params=a, x5, x6, x7, x8, x9, x10, x11, x12, x13, z13, x14, z14, x15, z15, x16, z16, x17, z17, x18, z18`

Other compounds with this structure

Dy₁₁Cd₄₅, Er₁₁Cd₄₅, Gd₁₁Cd₄₅, Ho₁₁Cd₄₅, Lu₁₁Cd₄₅, Nd₁₁Cd₄₅, Tb₁₁Cd₄₅, Tm₁₁Cd₄₅, Pr₁₁Cd₄₅, Y₁₁Cd₄₅, Ce₁₁Hg₄₅, Nd₁₁Hg₄₅, Pr₁₁Hg₄₅, Sm₁₁Hg₄₅

Face-centered Cubic primitive vectors

$$\begin{aligned}\mathbf{a}_1 &= \frac{1}{2}a\hat{\mathbf{y}} + \frac{1}{2}a\hat{\mathbf{z}} \\ \mathbf{a}_2 &= \frac{1}{2}a\hat{\mathbf{x}} + \frac{1}{2}a\hat{\mathbf{z}} \\ \mathbf{a}_3 &= \frac{1}{2}a\hat{\mathbf{x}} + \frac{1}{2}a\hat{\mathbf{y}}\end{aligned}$$



Basis vectors

	Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B}_1$	$=$	0	$=$	0	(4a) Cd I
$\mathbf{B}_2$	$=$	$\frac{1}{2}\mathbf{a}_1 + \frac{1}{2}\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3$	$=$	$\frac{1}{2}a\hat{\mathbf{x}} + \frac{1}{2}a\hat{\mathbf{y}} + \frac{1}{2}a\hat{\mathbf{z}}$	(4b) Sm I
$\mathbf{B}_3$	$=$	$\frac{1}{4}\mathbf{a}_1 + \frac{1}{4}\mathbf{a}_2 + \frac{1}{4}\mathbf{a}_3$	$=$	$\frac{1}{4}a\hat{\mathbf{x}} + \frac{1}{4}a\hat{\mathbf{y}} + \frac{1}{4}a\hat{\mathbf{z}}$	(4c) Cd II
$\mathbf{B}_4$	$=$	$\frac{3}{4}\mathbf{a}_1 + \frac{3}{4}\mathbf{a}_2 + \frac{3}{4}\mathbf{a}_3$	$=$	$\frac{3}{4}a\hat{\mathbf{x}} + \frac{3}{4}a\hat{\mathbf{y}} + \frac{3}{4}a\hat{\mathbf{z}}$	(4d) Sm II
$\mathbf{B}_5$	$=$	$x_5\mathbf{a}_1 + x_5\mathbf{a}_2 + x_5\mathbf{a}_3$	$=$	$ax_5\hat{\mathbf{x}} + ax_5\hat{\mathbf{y}} + ax_5\hat{\mathbf{z}}$	(16e) Cd III
$\mathbf{B}_6$	$=$	$x_5\mathbf{a}_1 + x_5\mathbf{a}_2 - 3x_5\mathbf{a}_3$	$=$	$-ax_5\hat{\mathbf{x}} - ax_5\hat{\mathbf{y}} + ax_5\hat{\mathbf{z}}$	(16e) Cd III
$\mathbf{B}_7$	$=$	$x_5\mathbf{a}_1 - 3x_5\mathbf{a}_2 + x_5\mathbf{a}_3$	$=$	$-ax_5\hat{\mathbf{x}} + ax_5\hat{\mathbf{y}} - ax_5\hat{\mathbf{z}}$	(16e) Cd III
$\mathbf{B}_8$	$=$	$-3x_5\mathbf{a}_1 + x_5\mathbf{a}_2 + x_5\mathbf{a}_3$	$=$	$ax_5\hat{\mathbf{x}} - ax_5\hat{\mathbf{y}} - ax_5\hat{\mathbf{z}}$	(16e) Cd III
$\mathbf{B}_9$	$=$	$x_6\mathbf{a}_1 + x_6\mathbf{a}_2 + x_6\mathbf{a}_3$	$=$	$ax_6\hat{\mathbf{x}} + ax_6\hat{\mathbf{y}} + ax_6\hat{\mathbf{z}}$	(16e) Cd IV
$\mathbf{B}_{10}$	$=$	$x_6\mathbf{a}_1 + x_6\mathbf{a}_2 - 3x_6\mathbf{a}_3$	$=$	$-ax_6\hat{\mathbf{x}} - ax_6\hat{\mathbf{y}} + ax_6\hat{\mathbf{z}}$	(16e) Cd IV
$\mathbf{B}_{11}$	$=$	$x_6\mathbf{a}_1 - 3x_6\mathbf{a}_2 + x_6\mathbf{a}_3$	$=$	$-ax_6\hat{\mathbf{x}} + ax_6\hat{\mathbf{y}} - ax_6\hat{\mathbf{z}}$	(16e) Cd IV
$\mathbf{B}_{12}$	$=$	$-3x_6\mathbf{a}_1 + x_6\mathbf{a}_2 + x_6\mathbf{a}_3$	$=$	$ax_6\hat{\mathbf{x}} - ax_6\hat{\mathbf{y}} - ax_6\hat{\mathbf{z}}$	(16e) Cd IV
$\mathbf{B}_{13}$	$=$	$x_7\mathbf{a}_1 + x_7\mathbf{a}_2 + x_7\mathbf{a}_3$	$=$	$ax_7\hat{\mathbf{x}} + ax_7\hat{\mathbf{y}} + ax_7\hat{\mathbf{z}}$	(16e) Cd V
$\mathbf{B}_{14}$	$=$	$x_7\mathbf{a}_1 + x_7\mathbf{a}_2 - 3x_7\mathbf{a}_3$	$=$	$-ax_7\hat{\mathbf{x}} - ax_7\hat{\mathbf{y}} + ax_7\hat{\mathbf{z}}$	(16e) Cd V
$\mathbf{B}_{15}$	$=$	$x_7\mathbf{a}_1 - 3x_7\mathbf{a}_2 + x_7\mathbf{a}_3$	$=$	$-ax_7\hat{\mathbf{x}} + ax_7\hat{\mathbf{y}} - ax_7\hat{\mathbf{z}}$	(16e) Cd V
$\mathbf{B}_{16}$	$=$	$-3x_7\mathbf{a}_1 + x_7\mathbf{a}_2 + x_7\mathbf{a}_3$	$=$	$ax_7\hat{\mathbf{x}} - ax_7\hat{\mathbf{y}} - ax_7\hat{\mathbf{z}}$	(16e) Cd V
$\mathbf{B}_{17}$	$=$	$x_8\mathbf{a}_1 + x_8\mathbf{a}_2 + x_8\mathbf{a}_3$	$=$	$ax_8\hat{\mathbf{x}} + ax_8\hat{\mathbf{y}} + ax_8\hat{\mathbf{z}}$	(16e) Cd VI
$\mathbf{B}_{18}$	$=$	$x_8\mathbf{a}_1 + x_8\mathbf{a}_2 - 3x_8\mathbf{a}_3$	$=$	$-ax_8\hat{\mathbf{x}} - ax_8\hat{\mathbf{y}} + ax_8\hat{\mathbf{z}}$	(16e) Cd VI
$\mathbf{B}_{19}$	$=$	$x_8\mathbf{a}_1 - 3x_8\mathbf{a}_2 + x_8\mathbf{a}_3$	$=$	$-ax_8\hat{\mathbf{x}} + ax_8\hat{\mathbf{y}} - ax_8\hat{\mathbf{z}}$	(16e) Cd VI
$\mathbf{B}_{20}$	$=$	$-3x_8\mathbf{a}_1 + x_8\mathbf{a}_2 + x_8\mathbf{a}_3$	$=$	$ax_8\hat{\mathbf{x}} - ax_8\hat{\mathbf{y}} - ax_8\hat{\mathbf{z}}$	(16e) Cd VI
$\mathbf{B}_{21}$	$=$	$x_9\mathbf{a}_1 + x_9\mathbf{a}_2 + x_9\mathbf{a}_3$	$=$	$ax_9\hat{\mathbf{x}} + ax_9\hat{\mathbf{y}} + ax_9\hat{\mathbf{z}}$	(16e) Sm III

$\mathbf{B}_{22} =$	$x_9 \mathbf{a}_1 + x_9 \mathbf{a}_2 - 3x_9 \mathbf{a}_3$	$=$	$-ax_9 \hat{\mathbf{x}} - ax_9 \hat{\mathbf{y}} + ax_9 \hat{\mathbf{z}}$	(16e)	Sm III
$\mathbf{B}_{23} =$	$x_9 \mathbf{a}_1 - 3x_9 \mathbf{a}_2 + x_9 \mathbf{a}_3$	$=$	$-ax_9 \hat{\mathbf{x}} + ax_9 \hat{\mathbf{y}} - ax_9 \hat{\mathbf{z}}$	(16e)	Sm III
$\mathbf{B}_{24} =$	$-3x_9 \mathbf{a}_1 + x_9 \mathbf{a}_2 + x_9 \mathbf{a}_3$	$=$	$ax_9 \hat{\mathbf{x}} - ax_9 \hat{\mathbf{y}} - ax_9 \hat{\mathbf{z}}$	(16e)	Sm III
$\mathbf{B}_{25} =$	$x_{10} \mathbf{a}_1 + x_{10} \mathbf{a}_2 + x_{10} \mathbf{a}_3$	$=$	$ax_{10} \hat{\mathbf{x}} + ax_{10} \hat{\mathbf{y}} + ax_{10} \hat{\mathbf{z}}$	(16e)	Sm IV
$\mathbf{B}_{26} =$	$x_{10} \mathbf{a}_1 + x_{10} \mathbf{a}_2 - 3x_{10} \mathbf{a}_3$	$=$	$-ax_{10} \hat{\mathbf{x}} - ax_{10} \hat{\mathbf{y}} + ax_{10} \hat{\mathbf{z}}$	(16e)	Sm IV
$\mathbf{B}_{27} =$	$x_{10} \mathbf{a}_1 - 3x_{10} \mathbf{a}_2 + x_{10} \mathbf{a}_3$	$=$	$-ax_{10} \hat{\mathbf{x}} + ax_{10} \hat{\mathbf{y}} - ax_{10} \hat{\mathbf{z}}$	(16e)	Sm IV
$\mathbf{B}_{28} =$	$-3x_{10} \mathbf{a}_1 + x_{10} \mathbf{a}_2 + x_{10} \mathbf{a}_3$	$=$	$ax_{10} \hat{\mathbf{x}} - ax_{10} \hat{\mathbf{y}} - ax_{10} \hat{\mathbf{z}}$	(16e)	Sm IV
$\mathbf{B}_{29} =$	$-x_{11} \mathbf{a}_1 + x_{11} \mathbf{a}_2 + x_{11} \mathbf{a}_3$	$=$	$ax_{11} \hat{\mathbf{x}}$	(24f)	Cd VII
$\mathbf{B}_{30} =$	$x_{11} \mathbf{a}_1 - x_{11} \mathbf{a}_2 - x_{11} \mathbf{a}_3$	$=$	$-ax_{11} \hat{\mathbf{x}}$	(24f)	Cd VII
$\mathbf{B}_{31} =$	$x_{11} \mathbf{a}_1 - x_{11} \mathbf{a}_2 + x_{11} \mathbf{a}_3$	$=$	$ax_{11} \hat{\mathbf{y}}$	(24f)	Cd VII
$\mathbf{B}_{32} =$	$-x_{11} \mathbf{a}_1 + x_{11} \mathbf{a}_2 - x_{11} \mathbf{a}_3$	$=$	$-ax_{11} \hat{\mathbf{y}}$	(24f)	Cd VII
$\mathbf{B}_{33} =$	$x_{11} \mathbf{a}_1 + x_{11} \mathbf{a}_2 - x_{11} \mathbf{a}_3$	$=$	$ax_{11} \hat{\mathbf{z}}$	(24f)	Cd VII
$\mathbf{B}_{34} =$	$-x_{11} \mathbf{a}_1 - x_{11} \mathbf{a}_2 + x_{11} \mathbf{a}_3$	$=$	$-ax_{11} \hat{\mathbf{z}}$	(24f)	Cd VII
$\mathbf{B}_{35} =$	$-(x_{12} - \frac{1}{2}) \mathbf{a}_1 + x_{12} \mathbf{a}_2 + x_{12} \mathbf{a}_3$	$=$	$ax_{12} \hat{\mathbf{x}} + \frac{1}{4}a \hat{\mathbf{y}} + \frac{1}{4}a \hat{\mathbf{z}}$	(24g)	Cd VIII
$\mathbf{B}_{36} =$	$x_{12} \mathbf{a}_1 - (x_{12} - \frac{1}{2}) \mathbf{a}_2 -$ $(x_{12} - \frac{1}{2}) \mathbf{a}_3$	$=$	$-a(x_{12} - \frac{1}{2}) \hat{\mathbf{x}} + \frac{1}{4}a \hat{\mathbf{y}} + \frac{1}{4}a \hat{\mathbf{z}}$	(24g)	Cd VIII
$\mathbf{B}_{37} =$	$x_{12} \mathbf{a}_1 - (x_{12} - \frac{1}{2}) \mathbf{a}_2 + x_{12} \mathbf{a}_3$	$=$	$\frac{1}{4}a \hat{\mathbf{x}} + ax_{12} \hat{\mathbf{y}} + \frac{1}{4}a \hat{\mathbf{z}}$	(24g)	Cd VIII
$\mathbf{B}_{38} =$	$-(x_{12} - \frac{1}{2}) \mathbf{a}_1 + x_{12} \mathbf{a}_2 -$ $(x_{12} - \frac{1}{2}) \mathbf{a}_3$	$=$	$\frac{1}{4}a \hat{\mathbf{x}} - a(x_{12} - \frac{1}{2}) \hat{\mathbf{y}} + \frac{1}{4}a \hat{\mathbf{z}}$	(24g)	Cd VIII
$\mathbf{B}_{39} =$	$x_{12} \mathbf{a}_1 + x_{12} \mathbf{a}_2 - (x_{12} - \frac{1}{2}) \mathbf{a}_3$	$=$	$\frac{1}{4}a \hat{\mathbf{x}} + \frac{1}{4}a \hat{\mathbf{y}} + ax_{12} \hat{\mathbf{z}}$	(24g)	Cd VIII
$\mathbf{B}_{40} =$	$-(x_{12} - \frac{1}{2}) \mathbf{a}_1 - (x_{12} - \frac{1}{2}) \mathbf{a}_2 +$ $x_{12} \mathbf{a}_3$	$=$	$\frac{1}{4}a \hat{\mathbf{x}} + \frac{1}{4}a \hat{\mathbf{y}} - a(x_{12} - \frac{1}{2}) \hat{\mathbf{z}}$	(24g)	Cd VIII
$\mathbf{B}_{41} =$	$z_{13} \mathbf{a}_1 + z_{13} \mathbf{a}_2 + (2x_{13} - z_{13}) \mathbf{a}_3$	$=$	$ax_{13} \hat{\mathbf{x}} + ax_{13} \hat{\mathbf{y}} + az_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{42} =$	$z_{13} \mathbf{a}_1 + z_{13} \mathbf{a}_2 - (2x_{13} + z_{13}) \mathbf{a}_3$	$=$	$-ax_{13} \hat{\mathbf{x}} - ax_{13} \hat{\mathbf{y}} + az_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{43} =$	$(2x_{13} - z_{13}) \mathbf{a}_1 -$ $(2x_{13} + z_{13}) \mathbf{a}_2 + z_{13} \mathbf{a}_3$	$=$	$-ax_{13} \hat{\mathbf{x}} + ax_{13} \hat{\mathbf{y}} - az_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{44} =$	$-(2x_{13} + z_{13}) \mathbf{a}_1 +$ $(2x_{13} - z_{13}) \mathbf{a}_2 + z_{13} \mathbf{a}_3$	$=$	$ax_{13} \hat{\mathbf{x}} - ax_{13} \hat{\mathbf{y}} - az_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{45} =$	$(2x_{13} - z_{13}) \mathbf{a}_1 + z_{13} \mathbf{a}_2 + z_{13} \mathbf{a}_3$	$=$	$az_{13} \hat{\mathbf{x}} + ax_{13} \hat{\mathbf{y}} + ax_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{46} =$	$-(2x_{13} + z_{13}) \mathbf{a}_1 + z_{13} \mathbf{a}_2 + z_{13} \mathbf{a}_3$	$=$	$az_{13} \hat{\mathbf{x}} - ax_{13} \hat{\mathbf{y}} - ax_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{47} =$	$z_{13} \mathbf{a}_1 + (2x_{13} - z_{13}) \mathbf{a}_2 -$ $(2x_{13} + z_{13}) \mathbf{a}_3$	$=$	$-az_{13} \hat{\mathbf{x}} - ax_{13} \hat{\mathbf{y}} + ax_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{48} =$	$z_{13} \mathbf{a}_1 - (2x_{13} + z_{13}) \mathbf{a}_2 +$ $(2x_{13} - z_{13}) \mathbf{a}_3$	$=$	$-az_{13} \hat{\mathbf{x}} + ax_{13} \hat{\mathbf{y}} - ax_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{49} =$	$z_{13} \mathbf{a}_1 + (2x_{13} - z_{13}) \mathbf{a}_2 + z_{13} \mathbf{a}_3$	$=$	$ax_{13} \hat{\mathbf{x}} + az_{13} \hat{\mathbf{y}} + ax_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{50} =$	$z_{13} \mathbf{a}_1 - (2x_{13} + z_{13}) \mathbf{a}_2 + z_{13} \mathbf{a}_3$	$=$	$-ax_{13} \hat{\mathbf{x}} + az_{13} \hat{\mathbf{y}} - ax_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{51} =$	$-(2x_{13} + z_{13}) \mathbf{a}_1 + z_{13} \mathbf{a}_2 +$ $(2x_{13} - z_{13}) \mathbf{a}_3$	$=$	$ax_{13} \hat{\mathbf{x}} - az_{13} \hat{\mathbf{y}} - ax_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{52} =$	$(2x_{13} - z_{13}) \mathbf{a}_1 + z_{13} \mathbf{a}_2 -$ $(2x_{13} + z_{13}) \mathbf{a}_3$	$=$	$-ax_{13} \hat{\mathbf{x}} - az_{13} \hat{\mathbf{y}} + ax_{13} \hat{\mathbf{z}}$	(48h)	Cd IX
$\mathbf{B}_{53} =$	$z_{14} \mathbf{a}_1 + z_{14} \mathbf{a}_2 + (2x_{14} - z_{14}) \mathbf{a}_3$	$=$	$ax_{14} \hat{\mathbf{x}} + ax_{14} \hat{\mathbf{y}} + az_{14} \hat{\mathbf{z}}$	(48h)	Cd X
$\mathbf{B}_{54} =$	$z_{14} \mathbf{a}_1 + z_{14} \mathbf{a}_2 - (2x_{14} + z_{14}) \mathbf{a}_3$	$=$	$-ax_{14} \hat{\mathbf{x}} - ax_{14} \hat{\mathbf{y}} + az_{14} \hat{\mathbf{z}}$	(48h)	Cd X
$\mathbf{B}_{55} =$	$(2x_{14} - z_{14}) \mathbf{a}_1 -$ $(2x_{14} + z_{14}) \mathbf{a}_2 + z_{14} \mathbf{a}_3$	$=$	$-ax_{14} \hat{\mathbf{x}} + ax_{14} \hat{\mathbf{y}} - az_{14} \hat{\mathbf{z}}$	(48h)	Cd X

$\mathbf{B}_{56}$	$=$	$-(2x_{14} + z_{14}) \mathbf{a}_1 +$	$=$	$ax_{14} \hat{\mathbf{x}} - ax_{14} \hat{\mathbf{y}} - az_{14} \hat{\mathbf{z}}$	(48h)	Cd X
		$(2x_{14} - z_{14}) \mathbf{a}_2 + z_{14} \mathbf{a}_3$				
$\mathbf{B}_{57}$	$=$	$(2x_{14} - z_{14}) \mathbf{a}_1 + z_{14} \mathbf{a}_2 + z_{14} \mathbf{a}_3$	$=$	$az_{14} \hat{\mathbf{x}} + ax_{14} \hat{\mathbf{y}} + ax_{14} \hat{\mathbf{z}}$	(48h)	Cd X
$\mathbf{B}_{58}$	$=$	$-(2x_{14} + z_{14}) \mathbf{a}_1 + z_{14} \mathbf{a}_2 + z_{14} \mathbf{a}_3$	$=$	$az_{14} \hat{\mathbf{x}} - ax_{14} \hat{\mathbf{y}} - ax_{14} \hat{\mathbf{z}}$	(48h)	Cd X
$\mathbf{B}_{59}$	$=$	$z_{14} \mathbf{a}_1 + (2x_{14} - z_{14}) \mathbf{a}_2 -$	$=$	$-az_{14} \hat{\mathbf{x}} - ax_{14} \hat{\mathbf{y}} + ax_{14} \hat{\mathbf{z}}$	(48h)	Cd X
		$(2x_{14} + z_{14}) \mathbf{a}_3$				
$\mathbf{B}_{60}$	$=$	$z_{14} \mathbf{a}_1 - (2x_{14} + z_{14}) \mathbf{a}_2 +$	$=$	$-az_{14} \hat{\mathbf{x}} + ax_{14} \hat{\mathbf{y}} - ax_{14} \hat{\mathbf{z}}$	(48h)	Cd X
		$(2x_{14} - z_{14}) \mathbf{a}_3$				
$\mathbf{B}_{61}$	$=$	$z_{14} \mathbf{a}_1 + (2x_{14} - z_{14}) \mathbf{a}_2 + z_{14} \mathbf{a}_3$	$=$	$ax_{14} \hat{\mathbf{x}} + az_{14} \hat{\mathbf{y}} + ax_{14} \hat{\mathbf{z}}$	(48h)	Cd X
$\mathbf{B}_{62}$	$=$	$z_{14} \mathbf{a}_1 - (2x_{14} + z_{14}) \mathbf{a}_2 + z_{14} \mathbf{a}_3$	$=$	$-ax_{14} \hat{\mathbf{x}} + az_{14} \hat{\mathbf{y}} - ax_{14} \hat{\mathbf{z}}$	(48h)	Cd X
$\mathbf{B}_{63}$	$=$	$-(2x_{14} + z_{14}) \mathbf{a}_1 + z_{14} \mathbf{a}_2 +$	$=$	$ax_{14} \hat{\mathbf{x}} - az_{14} \hat{\mathbf{y}} - ax_{14} \hat{\mathbf{z}}$	(48h)	Cd X
		$(2x_{14} - z_{14}) \mathbf{a}_3$				
$\mathbf{B}_{64}$	$=$	$(2x_{14} - z_{14}) \mathbf{a}_1 + z_{14} \mathbf{a}_2 -$	$=$	$-ax_{14} \hat{\mathbf{x}} - az_{14} \hat{\mathbf{y}} + ax_{14} \hat{\mathbf{z}}$	(48h)	Cd X
		$(2x_{14} + z_{14}) \mathbf{a}_3$				
$\mathbf{B}_{65}$	$=$	$z_{15} \mathbf{a}_1 + z_{15} \mathbf{a}_2 + (2x_{15} - z_{15}) \mathbf{a}_3$	$=$	$ax_{15} \hat{\mathbf{x}} + ax_{15} \hat{\mathbf{y}} + az_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
$\mathbf{B}_{66}$	$=$	$z_{15} \mathbf{a}_1 + z_{15} \mathbf{a}_2 - (2x_{15} + z_{15}) \mathbf{a}_3$	$=$	$-ax_{15} \hat{\mathbf{x}} - ax_{15} \hat{\mathbf{y}} + az_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
$\mathbf{B}_{67}$	$=$	$(2x_{15} - z_{15}) \mathbf{a}_1 -$	$=$	$-ax_{15} \hat{\mathbf{x}} + ax_{15} \hat{\mathbf{y}} - az_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
		$(2x_{15} + z_{15}) \mathbf{a}_2 + z_{15} \mathbf{a}_3$				
$\mathbf{B}_{68}$	$=$	$-(2x_{15} + z_{15}) \mathbf{a}_1 +$	$=$	$ax_{15} \hat{\mathbf{x}} - ax_{15} \hat{\mathbf{y}} - az_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
		$(2x_{15} - z_{15}) \mathbf{a}_2 + z_{15} \mathbf{a}_3$				
$\mathbf{B}_{69}$	$=$	$(2x_{15} - z_{15}) \mathbf{a}_1 + z_{15} \mathbf{a}_2 + z_{15} \mathbf{a}_3$	$=$	$az_{15} \hat{\mathbf{x}} + ax_{15} \hat{\mathbf{y}} + ax_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
$\mathbf{B}_{70}$	$=$	$-(2x_{15} + z_{15}) \mathbf{a}_1 + z_{15} \mathbf{a}_2 + z_{15} \mathbf{a}_3$	$=$	$az_{15} \hat{\mathbf{x}} - ax_{15} \hat{\mathbf{y}} - ax_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
$\mathbf{B}_{71}$	$=$	$z_{15} \mathbf{a}_1 + (2x_{15} - z_{15}) \mathbf{a}_2 -$	$=$	$-az_{15} \hat{\mathbf{x}} - ax_{15} \hat{\mathbf{y}} + ax_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
		$(2x_{15} + z_{15}) \mathbf{a}_3$				
$\mathbf{B}_{72}$	$=$	$z_{15} \mathbf{a}_1 - (2x_{15} + z_{15}) \mathbf{a}_2 +$	$=$	$-az_{15} \hat{\mathbf{x}} + ax_{15} \hat{\mathbf{y}} - ax_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
		$(2x_{15} - z_{15}) \mathbf{a}_3$				
$\mathbf{B}_{73}$	$=$	$z_{15} \mathbf{a}_1 + (2x_{15} - z_{15}) \mathbf{a}_2 + z_{15} \mathbf{a}_3$	$=$	$ax_{15} \hat{\mathbf{x}} + az_{15} \hat{\mathbf{y}} + ax_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
$\mathbf{B}_{74}$	$=$	$z_{15} \mathbf{a}_1 - (2x_{15} + z_{15}) \mathbf{a}_2 + z_{15} \mathbf{a}_3$	$=$	$-ax_{15} \hat{\mathbf{x}} + az_{15} \hat{\mathbf{y}} - ax_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
$\mathbf{B}_{75}$	$=$	$-(2x_{15} + z_{15}) \mathbf{a}_1 + z_{15} \mathbf{a}_2 +$	$=$	$ax_{15} \hat{\mathbf{x}} - az_{15} \hat{\mathbf{y}} - ax_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
		$(2x_{15} - z_{15}) \mathbf{a}_3$				
$\mathbf{B}_{76}$	$=$	$(2x_{15} - z_{15}) \mathbf{a}_1 + z_{15} \mathbf{a}_2 -$	$=$	$-ax_{15} \hat{\mathbf{x}} - az_{15} \hat{\mathbf{y}} + ax_{15} \hat{\mathbf{z}}$	(48h)	Cd XI
		$(2x_{15} + z_{15}) \mathbf{a}_3$				
$\mathbf{B}_{77}$	$=$	$z_{16} \mathbf{a}_1 + z_{16} \mathbf{a}_2 + (2x_{16} - z_{16}) \mathbf{a}_3$	$=$	$ax_{16} \hat{\mathbf{x}} + ax_{16} \hat{\mathbf{y}} + az_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
$\mathbf{B}_{78}$	$=$	$z_{16} \mathbf{a}_1 + z_{16} \mathbf{a}_2 - (2x_{16} + z_{16}) \mathbf{a}_3$	$=$	$-ax_{16} \hat{\mathbf{x}} - ax_{16} \hat{\mathbf{y}} + az_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
$\mathbf{B}_{79}$	$=$	$(2x_{16} - z_{16}) \mathbf{a}_1 -$	$=$	$-ax_{16} \hat{\mathbf{x}} + ax_{16} \hat{\mathbf{y}} - az_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
		$(2x_{16} + z_{16}) \mathbf{a}_2 + z_{16} \mathbf{a}_3$				
$\mathbf{B}_{80}$	$=$	$-(2x_{16} + z_{16}) \mathbf{a}_1 +$	$=$	$ax_{16} \hat{\mathbf{x}} - ax_{16} \hat{\mathbf{y}} - az_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
		$(2x_{16} - z_{16}) \mathbf{a}_2 + z_{16} \mathbf{a}_3$				
$\mathbf{B}_{81}$	$=$	$(2x_{16} - z_{16}) \mathbf{a}_1 + z_{16} \mathbf{a}_2 + z_{16} \mathbf{a}_3$	$=$	$az_{16} \hat{\mathbf{x}} + ax_{16} \hat{\mathbf{y}} + ax_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
$\mathbf{B}_{82}$	$=$	$-(2x_{16} + z_{16}) \mathbf{a}_1 + z_{16} \mathbf{a}_2 + z_{16} \mathbf{a}_3$	$=$	$az_{16} \hat{\mathbf{x}} - ax_{16} \hat{\mathbf{y}} - ax_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
$\mathbf{B}_{83}$	$=$	$z_{16} \mathbf{a}_1 + (2x_{16} - z_{16}) \mathbf{a}_2 -$	$=$	$-az_{16} \hat{\mathbf{x}} - ax_{16} \hat{\mathbf{y}} + ax_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
		$(2x_{16} + z_{16}) \mathbf{a}_3$				
$\mathbf{B}_{84}$	$=$	$z_{16} \mathbf{a}_1 - (2x_{16} + z_{16}) \mathbf{a}_2 +$	$=$	$-az_{16} \hat{\mathbf{x}} + ax_{16} \hat{\mathbf{y}} - ax_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
		$(2x_{16} - z_{16}) \mathbf{a}_3$				
$\mathbf{B}_{85}$	$=$	$z_{16} \mathbf{a}_1 + (2x_{16} - z_{16}) \mathbf{a}_2 + z_{16} \mathbf{a}_3$	$=$	$ax_{16} \hat{\mathbf{x}} + az_{16} \hat{\mathbf{y}} + ax_{16} \hat{\mathbf{z}}$	(48h)	Cd XII

$\mathbf{B}_{86} =$	$z_{16} \mathbf{a}_1 - (2x_{16} + z_{16}) \mathbf{a}_2 + z_{16} \mathbf{a}_3$	$=$	$-ax_{16} \hat{\mathbf{x}} + az_{16} \hat{\mathbf{y}} - ax_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
$\mathbf{B}_{87} =$	$-(2x_{16} + z_{16}) \mathbf{a}_1 + z_{16} \mathbf{a}_2 +$ $(2x_{16} - z_{16}) \mathbf{a}_3$	$=$	$ax_{16} \hat{\mathbf{x}} - az_{16} \hat{\mathbf{y}} - ax_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
$\mathbf{B}_{88} =$	$(2x_{16} - z_{16}) \mathbf{a}_1 + z_{16} \mathbf{a}_2 -$ $(2x_{16} + z_{16}) \mathbf{a}_3$	$=$	$-ax_{16} \hat{\mathbf{x}} - az_{16} \hat{\mathbf{y}} + ax_{16} \hat{\mathbf{z}}$	(48h)	Cd XII
$\mathbf{B}_{89} =$	$z_{17} \mathbf{a}_1 + z_{17} \mathbf{a}_2 + (2x_{17} - z_{17}) \mathbf{a}_3$	$=$	$ax_{17} \hat{\mathbf{x}} + ax_{17} \hat{\mathbf{y}} + az_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{90} =$	$z_{17} \mathbf{a}_1 + z_{17} \mathbf{a}_2 - (2x_{17} + z_{17}) \mathbf{a}_3$	$=$	$-ax_{17} \hat{\mathbf{x}} - ax_{17} \hat{\mathbf{y}} + az_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{91} =$	$(2x_{17} - z_{17}) \mathbf{a}_1 -$ $(2x_{17} + z_{17}) \mathbf{a}_2 + z_{17} \mathbf{a}_3$	$=$	$-ax_{17} \hat{\mathbf{x}} + ax_{17} \hat{\mathbf{y}} - az_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{92} =$	$-(2x_{17} + z_{17}) \mathbf{a}_1 +$ $(2x_{17} - z_{17}) \mathbf{a}_2 + z_{17} \mathbf{a}_3$	$=$	$ax_{17} \hat{\mathbf{x}} - ax_{17} \hat{\mathbf{y}} - az_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{93} =$	$(2x_{17} - z_{17}) \mathbf{a}_1 + z_{17} \mathbf{a}_2 + z_{17} \mathbf{a}_3$	$=$	$az_{17} \hat{\mathbf{x}} + ax_{17} \hat{\mathbf{y}} + ax_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{94} =$	$-(2x_{17} + z_{17}) \mathbf{a}_1 + z_{17} \mathbf{a}_2 + z_{17} \mathbf{a}_3$	$=$	$az_{17} \hat{\mathbf{x}} - ax_{17} \hat{\mathbf{y}} - ax_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{95} =$	$z_{17} \mathbf{a}_1 + (2x_{17} - z_{17}) \mathbf{a}_2 -$ $(2x_{17} + z_{17}) \mathbf{a}_3$	$=$	$-az_{17} \hat{\mathbf{x}} - ax_{17} \hat{\mathbf{y}} + ax_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{96} =$	$z_{17} \mathbf{a}_1 - (2x_{17} + z_{17}) \mathbf{a}_2 +$ $(2x_{17} - z_{17}) \mathbf{a}_3$	$=$	$-az_{17} \hat{\mathbf{x}} + ax_{17} \hat{\mathbf{y}} - ax_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{97} =$	$z_{17} \mathbf{a}_1 + (2x_{17} - z_{17}) \mathbf{a}_2 + z_{17} \mathbf{a}_3$	$=$	$ax_{17} \hat{\mathbf{x}} + az_{17} \hat{\mathbf{y}} + ax_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{98} =$	$z_{17} \mathbf{a}_1 - (2x_{17} + z_{17}) \mathbf{a}_2 + z_{17} \mathbf{a}_3$	$=$	$-ax_{17} \hat{\mathbf{x}} + az_{17} \hat{\mathbf{y}} - ax_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{99} =$	$-(2x_{17} + z_{17}) \mathbf{a}_1 + z_{17} \mathbf{a}_2 +$ $(2x_{17} - z_{17}) \mathbf{a}_3$	$=$	$ax_{17} \hat{\mathbf{x}} - az_{17} \hat{\mathbf{y}} - ax_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{100} =$	$(2x_{17} - z_{17}) \mathbf{a}_1 + z_{17} \mathbf{a}_2 -$ $(2x_{17} + z_{17}) \mathbf{a}_3$	$=$	$-ax_{17} \hat{\mathbf{x}} - az_{17} \hat{\mathbf{y}} + ax_{17} \hat{\mathbf{z}}$	(48h)	Cd XIII
$\mathbf{B}_{101} =$	$z_{18} \mathbf{a}_1 + z_{18} \mathbf{a}_2 + (2x_{18} - z_{18}) \mathbf{a}_3$	$=$	$ax_{18} \hat{\mathbf{x}} + ax_{18} \hat{\mathbf{y}} + az_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{102} =$	$z_{18} \mathbf{a}_1 + z_{18} \mathbf{a}_2 - (2x_{18} + z_{18}) \mathbf{a}_3$	$=$	$-ax_{18} \hat{\mathbf{x}} - ax_{18} \hat{\mathbf{y}} + az_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{103} =$	$(2x_{18} - z_{18}) \mathbf{a}_1 -$ $(2x_{18} + z_{18}) \mathbf{a}_2 + z_{18} \mathbf{a}_3$	$=$	$-ax_{18} \hat{\mathbf{x}} + ax_{18} \hat{\mathbf{y}} - az_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{104} =$	$-(2x_{18} + z_{18}) \mathbf{a}_1 +$ $(2x_{18} - z_{18}) \mathbf{a}_2 + z_{18} \mathbf{a}_3$	$=$	$ax_{18} \hat{\mathbf{x}} - ax_{18} \hat{\mathbf{y}} - az_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{105} =$	$(2x_{18} - z_{18}) \mathbf{a}_1 + z_{18} \mathbf{a}_2 + z_{18} \mathbf{a}_3$	$=$	$az_{18} \hat{\mathbf{x}} + ax_{18} \hat{\mathbf{y}} + ax_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{106} =$	$-(2x_{18} + z_{18}) \mathbf{a}_1 + z_{18} \mathbf{a}_2 + z_{18} \mathbf{a}_3$	$=$	$az_{18} \hat{\mathbf{x}} - ax_{18} \hat{\mathbf{y}} - ax_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{107} =$	$z_{18} \mathbf{a}_1 + (2x_{18} - z_{18}) \mathbf{a}_2 -$ $(2x_{18} + z_{18}) \mathbf{a}_3$	$=$	$-az_{18} \hat{\mathbf{x}} - ax_{18} \hat{\mathbf{y}} + ax_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{108} =$	$z_{18} \mathbf{a}_1 - (2x_{18} + z_{18}) \mathbf{a}_2 +$ $(2x_{18} - z_{18}) \mathbf{a}_3$	$=$	$-az_{18} \hat{\mathbf{x}} + ax_{18} \hat{\mathbf{y}} - ax_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{109} =$	$z_{18} \mathbf{a}_1 + (2x_{18} - z_{18}) \mathbf{a}_2 + z_{18} \mathbf{a}_3$	$=$	$ax_{18} \hat{\mathbf{x}} + az_{18} \hat{\mathbf{y}} + ax_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{110} =$	$z_{18} \mathbf{a}_1 - (2x_{18} + z_{18}) \mathbf{a}_2 + z_{18} \mathbf{a}_3$	$=$	$-ax_{18} \hat{\mathbf{x}} + az_{18} \hat{\mathbf{y}} - ax_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{111} =$	$-(2x_{18} + z_{18}) \mathbf{a}_1 + z_{18} \mathbf{a}_2 +$ $(2x_{18} - z_{18}) \mathbf{a}_3$	$=$	$ax_{18} \hat{\mathbf{x}} - az_{18} \hat{\mathbf{y}} - ax_{18} \hat{\mathbf{z}}$	(48h)	Sm V
$\mathbf{B}_{112} =$	$(2x_{18} - z_{18}) \mathbf{a}_1 + z_{18} \mathbf{a}_2 -$ $(2x_{18} + z_{18}) \mathbf{a}_3$	$=$	$-ax_{18} \hat{\mathbf{x}} - az_{18} \hat{\mathbf{y}} + ax_{18} \hat{\mathbf{z}}$	(48h)	Sm V

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