

Co₅Ge₇ Structure:

A5B7_tI24_107_ac_abd-001

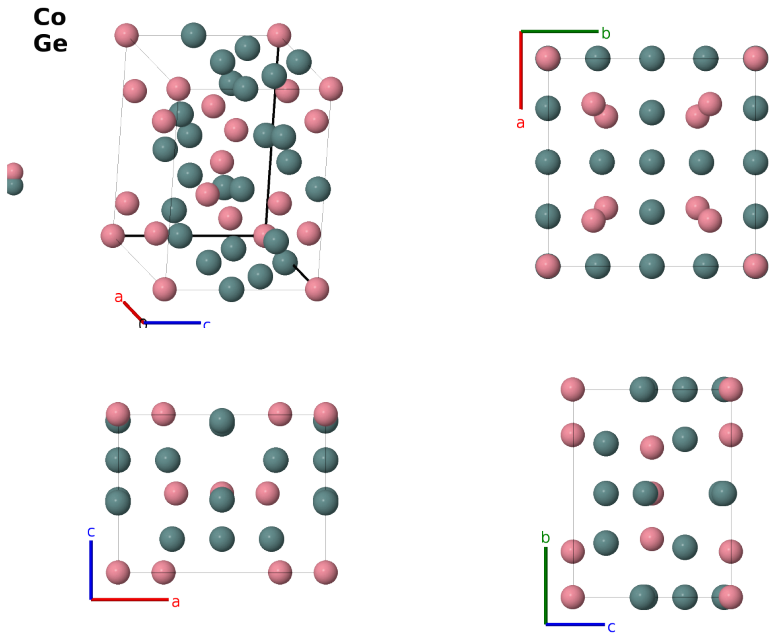
This structure previously used the label(s) **A5B7_tI24_107_ac_abd**. Calls to these addresses will be redirected here.

Cite this page as:

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<https://aflow.org/prototype-encyclopedia/Y7TL>

https://aflow.org/prototype-encyclopedia/A5B7_tI24_107_ac_abd-001



Prototype	Co ₅ Ge ₇
AFLOW prototype label	A5B7_tI24_107_ac_abd-001
ICSD	197263
CCDC	1924163
Pearson symbol	tI24
Space group number	107
Space group symbol	<i>I4mm</i>
AFLOW prototype command	<code>aflow --proto=A5B7_tI24_107_ac_abd-001</code> <code>--params=<i>a, c/a, z₁, z₂, z₃, x₄, z₄, x₅, z₅</i></code>

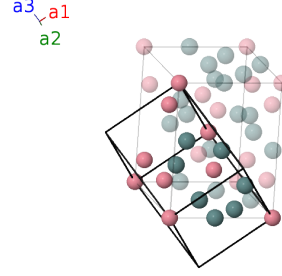
Other compounds with this structure

Ir₅Ge₇

- The origin of the z axis is arbitrary. We have chosen to place the Ge(2a) atom at the origin, taking $z_1 = 0$. (Schubert, 1960) instead set $z_4 = 0$.

Body-centered Tetragonal primitive vectors

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



Basis vectors

	Lattice coordinates		Cartesian coordinates	Wyckoff position	Atom type
$\mathbf{B}_1$	$= z_1 \mathbf{a}_1 + z_1 \mathbf{a}_2$	$=$	$cz_1 \hat{\mathbf{z}}$	(2a)	Co I
$\mathbf{B}_2$	$= z_2 \mathbf{a}_1 + z_2 \mathbf{a}_2$	$=$	$cz_2 \hat{\mathbf{z}}$	(2a)	Ge I
$\mathbf{B}_3$	$= (z_3 + \frac{1}{2}) \mathbf{a}_1 + z_3 \mathbf{a}_2 + \frac{1}{2} \mathbf{a}_3$	$=$	$\frac{1}{2}a \hat{\mathbf{y}} + cz_3 \hat{\mathbf{z}}$	(4b)	Ge II
$\mathbf{B}_4$	$= z_3 \mathbf{a}_1 + (z_3 + \frac{1}{2}) \mathbf{a}_2 + \frac{1}{2} \mathbf{a}_3$	$=$	$\frac{1}{2}a \hat{\mathbf{x}} + cz_3 \hat{\mathbf{z}}$	(4b)	Ge II
$\mathbf{B}_5$	$= (x_4 + z_4) \mathbf{a}_1 + (x_4 + z_4) \mathbf{a}_2 + 2x_4 \mathbf{a}_3$	$=$	$ax_4 \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} + cz_4 \hat{\mathbf{z}}$	(8c)	Co II
$\mathbf{B}_6$	$= -(x_4 - z_4) \mathbf{a}_1 - (x_4 - z_4) \mathbf{a}_2 - 2x_4 \mathbf{a}_3$	$=$	$-ax_4 \hat{\mathbf{x}} - ax_4 \hat{\mathbf{y}} + cz_4 \hat{\mathbf{z}}$	(8c)	Co II
$\mathbf{B}_7$	$= (x_4 + z_4) \mathbf{a}_1 - (x_4 - z_4) \mathbf{a}_2$	$=$	$-ax_4 \hat{\mathbf{x}} + ax_4 \hat{\mathbf{y}} + cz_4 \hat{\mathbf{z}}$	(8c)	Co II
$\mathbf{B}_8$	$= -(x_4 - z_4) \mathbf{a}_1 + (x_4 + z_4) \mathbf{a}_2$	$=$	$ax_4 \hat{\mathbf{x}} - ax_4 \hat{\mathbf{y}} + cz_4 \hat{\mathbf{z}}$	(8c)	Co II
$\mathbf{B}_9$	$= z_5 \mathbf{a}_1 + (x_5 + z_5) \mathbf{a}_2 + x_5 \mathbf{a}_3$	$=$	$ax_5 \hat{\mathbf{x}} + cz_5 \hat{\mathbf{z}}$	(8d)	Ge III
$\mathbf{B}_{10}$	$= z_5 \mathbf{a}_1 - (x_5 - z_5) \mathbf{a}_2 - x_5 \mathbf{a}_3$	$=$	$-ax_5 \hat{\mathbf{x}} + cz_5 \hat{\mathbf{z}}$	(8d)	Ge III
$\mathbf{B}_{11}$	$= (x_5 + z_5) \mathbf{a}_1 + z_5 \mathbf{a}_2 + x_5 \mathbf{a}_3$	$=$	$ax_5 \hat{\mathbf{y}} + cz_5 \hat{\mathbf{z}}$	(8d)	Ge III
$\mathbf{B}_{12}$	$= -(x_5 - z_5) \mathbf{a}_1 + z_5 \mathbf{a}_2 - x_5 \mathbf{a}_3$	$=$	$-ax_5 \hat{\mathbf{y}} + cz_5 \hat{\mathbf{z}}$	(8d)	Ge III

References

- [1] K. Schubert, T. R. Anantharaman, H. O. K. Ata, H. G. Meissner, M. Pötzschke, W. Rossteutscher, and E. Stolz, *Einige strukturelle Ergebnisse an metallischen Phasen (6)*, *Naturwissenschaften* **47**, 512 (1960), doi:10.1007/BF00641115.

Found in

- [1] P. Villars and K. Cenzual, *Pearson's Crystal Data – Crystal Structure Database for Inorganic Compounds* (2013). ASM International.

First cited in

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