

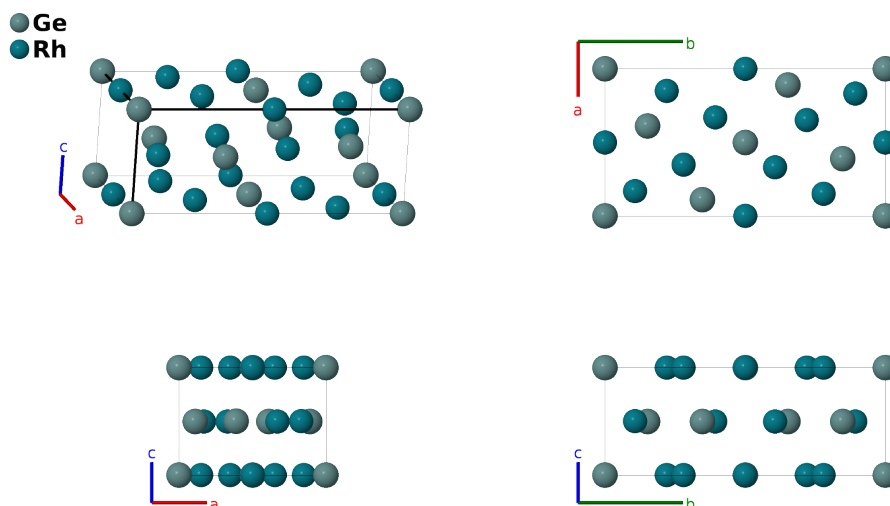
# Rh<sub>5</sub>Ge<sub>3</sub> Structure: A3B5\_oP16\_55\_ah\_cgh-001

This structure originally had the label A3B5\_oP16\_55\_ch\_agh. Calls to that address will be redirected here.

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<https://aflow.org/p/WXAV>

[https://aflow.org/p/A3B5\\_oP16\\_55\\_ah\\_cgh-001](https://aflow.org/p/A3B5_oP16_55_ah_cgh-001)



|                         |   |
|-------------------------|---|
| Prototype               | Ge <sub>3</sub> Rh <sub>5</sub>   |
| AFLOW prototype label   | A3B5_oP16_55_ah_cgh-001   |
| ICSD                    | 53891   |
| Pearson symbol          | oP16  |
| Space group number      | 55  |
| Space group symbol      | <i>Pbam</i>   |
| AFLOW prototype command | aflow --proto=A3B5_oP16_55_ah_cgh-001<br>--params= <i>a, b/a, c/a, x<sub>3</sub>, y<sub>3</sub>, x<sub>4</sub>, y<sub>4</sub>, x<sub>5</sub>, y<sub>5</sub></i> |

## Other compounds with this structure

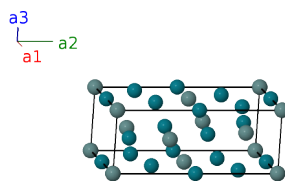
Pd<sub>5</sub>Al<sub>3</sub>, Pd<sub>5</sub>Ga<sub>3</sub>, Pd<sub>5</sub>In<sub>3</sub>, Pt<sub>5</sub>Al<sub>3</sub>, Rh<sub>5</sub>Si<sub>3</sub>

## Simple Orthorhombic primitive vectors

$$\mathbf{a}_1 = a \hat{x}$$

$$\mathbf{a}_2 = b \hat{y}$$

$$\mathbf{a}_3 = c \hat{z}$$



## Basis vectors

|                   | Lattice<br>coordinates |  | Cartesian<br>coordinates | Wyckoff<br>position   | Atom<br>type |
|-------------------|------------------------|--|--------------------------|---|--------------|
| $\mathbf{B}_1$    | $=$                    | $0$  | $=$                      | $0$   | (2a) Ge I    |
| $\mathbf{B}_2$    | $=$                    | $\frac{1}{2}\mathbf{a}_1 + \frac{1}{2}\mathbf{a}_2$  | $=$                      | $\frac{1}{2}a\hat{\mathbf{x}} + \frac{1}{2}b\hat{\mathbf{y}}$   | (2a) Ge I    |
| $\mathbf{B}_3$    | $=$                    | $\frac{1}{2}\mathbf{a}_2$  | $=$                      | $\frac{1}{2}b\hat{\mathbf{y}}$  | (2c) Rh I    |
| $\mathbf{B}_4$    | $=$                    | $\frac{1}{2}\mathbf{a}_1$  | $=$                      | $\frac{1}{2}a\hat{\mathbf{x}}$  | (2c) Rh I    |
| $\mathbf{B}_5$    | $=$                    | $x_3\mathbf{a}_1 + y_3\mathbf{a}_2$  | $=$                      | $ax_3\hat{\mathbf{x}} + by_3\hat{\mathbf{y}}$   | (4g) Rh II   |
| $\mathbf{B}_6$    | $=$                    | $-x_3\mathbf{a}_1 - y_3\mathbf{a}_2$   | $=$                      | $-ax_3\hat{\mathbf{x}} - by_3\hat{\mathbf{y}}$  | (4g) Rh II   |
| $\mathbf{B}_7$    | $=$                    | $-(x_3 - \frac{1}{2})\mathbf{a}_1 + (y_3 + \frac{1}{2})\mathbf{a}_2$                           | $=$                      | $-a(x_3 - \frac{1}{2})\hat{\mathbf{x}} + b(y_3 + \frac{1}{2})\hat{\mathbf{y}}$                                | (4g) Rh II   |
| $\mathbf{B}_8$    | $=$                    | $(x_3 + \frac{1}{2})\mathbf{a}_1 - (y_3 - \frac{1}{2})\mathbf{a}_2$                            | $=$                      | $a(x_3 + \frac{1}{2})\hat{\mathbf{x}} - b(y_3 - \frac{1}{2})\hat{\mathbf{y}}$                                 | (4g) Rh II   |
| $\mathbf{B}_9$    | $=$                    | $x_4\mathbf{a}_1 + y_4\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3$                                  | $=$                      | $ax_4\hat{\mathbf{x}} + by_4\hat{\mathbf{y}} + \frac{1}{2}c\hat{\mathbf{z}}$                                  | (4h) Ge II   |
| $\mathbf{B}_{10}$ | $=$                    | $-x_4\mathbf{a}_1 - y_4\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3$                                 | $=$                      | $-ax_4\hat{\mathbf{x}} - by_4\hat{\mathbf{y}} + \frac{1}{2}c\hat{\mathbf{z}}$                                 | (4h) Ge II   |
| $\mathbf{B}_{11}$ | $=$                    | $-(x_4 - \frac{1}{2})\mathbf{a}_1 + (y_4 + \frac{1}{2})\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3$ | $=$                      | $-a(x_4 - \frac{1}{2})\hat{\mathbf{x}} + b(y_4 + \frac{1}{2})\hat{\mathbf{y}} + \frac{1}{2}c\hat{\mathbf{z}}$ | (4h) Ge II   |
| $\mathbf{B}_{12}$ | $=$                    | $(x_4 + \frac{1}{2})\mathbf{a}_1 - (y_4 - \frac{1}{2})\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3$  | $=$                      | $a(x_4 + \frac{1}{2})\hat{\mathbf{x}} - b(y_4 - \frac{1}{2})\hat{\mathbf{y}} + \frac{1}{2}c\hat{\mathbf{z}}$  | (4h) Ge II   |
| $\mathbf{B}_{13}$ | $=$                    | $x_5\mathbf{a}_1 + y_5\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3$                                  | $=$                      | $ax_5\hat{\mathbf{x}} + by_5\hat{\mathbf{y}} + \frac{1}{2}c\hat{\mathbf{z}}$                                  | (4h) Rh III  |
| $\mathbf{B}_{14}$ | $=$                    | $-x_5\mathbf{a}_1 - y_5\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3$                                 | $=$                      | $-ax_5\hat{\mathbf{x}} - by_5\hat{\mathbf{y}} + \frac{1}{2}c\hat{\mathbf{z}}$                                 | (4h) Rh III  |
| $\mathbf{B}_{15}$ | $=$                    | $-(x_5 - \frac{1}{2})\mathbf{a}_1 + (y_5 + \frac{1}{2})\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3$ | $=$                      | $-a(x_5 - \frac{1}{2})\hat{\mathbf{x}} + b(y_5 + \frac{1}{2})\hat{\mathbf{y}} + \frac{1}{2}c\hat{\mathbf{z}}$ | (4h) Rh III  |
| $\mathbf{B}_{16}$ | $=$                    | $(x_5 + \frac{1}{2})\mathbf{a}_1 - (y_5 - \frac{1}{2})\mathbf{a}_2 + \frac{1}{2}\mathbf{a}_3$  | $=$                      | $a(x_5 + \frac{1}{2})\hat{\mathbf{x}} - b(y_5 - \frac{1}{2})\hat{\mathbf{y}} + \frac{1}{2}c\hat{\mathbf{z}}$  | (4h) Rh III  |

## References

- [1] S. Geller, *The rhodium-germanium system. I. The crystal structures of Rh<sub>2</sub>Ge, Rh<sub>5</sub>Ge<sub>3</sub> and RhGe*, Acta Cryst. **8**, 15–21 (1955), doi:10.1107/S0365110X55000030.

## Found in

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