

## Dirubidium digallium oxide bis(orthoborate)

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Key indicators: single-crystal X-ray study;  $T = 297$  K; mean  $\sigma(\text{O}-\text{B}) = 0.010$  Å;  $R$  factor = 0.037;  $wR$  factor = 0.091; data-to-parameter ratio = 13.3.

The title compound,  $\text{Rb}_2\text{Ga}_2\text{O}(\text{BO}_3)_2$ , is part of the homologous series  $A_2\text{Ga}_2\text{O}(\text{BO}_3)_2$  ( $A = \text{Na}, \text{K}, \text{Rb}$  and  $\text{Cs}$ ). The structure contains pairs of gallium-centered tetrahedra connected through a shared oxygen vertex. Orthoborate triangles connect the basal vertices of the tetrahedra, forming a three-dimensional network with voids occupied by rubidium ions.

## Related literature

For related literature, see: Chen *et al.* (2004); Corbel & Leblanc (2000); Smith (1995, 1997).

## Experimental

## Crystal data

 $\text{Rb}_2\text{Ga}_2\text{O}(\text{BO}_3)_2$   
 $M_r = 444.00$   
Monoclinic,  $P2_1/c$   
 $a = 8.8115$  (18) Å  
 $b = 7.7224$  (16) Å  
 $c = 11.997$  (3) Å  
 $\beta = 104.246$  (4)° $V = 791.3$  (3) Å<sup>3</sup>  
 $Z = 4$   
Mo  $K\alpha$  radiation  
 $\mu = 19.03$  mm<sup>-1</sup>  
 $T = 297$  (2) K  
0.23 × 0.21 × 0.19 mm

## Data collection

Bruker SMART APEX CCD diffractometer  
Absorption correction: numerical (SADABS; Sheldrick, 2003)  
 $T_{\min} = 0.118$ ,  $T_{\max} = 0.429$ 8611 measured reflections  
1568 independent reflections  
1151 reflections with  $I > 2\sigma(I)$   
 $R_{\text{int}} = 0.093$ 

## Refinement

 $R[F^2 > 2\sigma(F^2)] = 0.037$   
 $wR(F^2) = 0.091$   
 $S = 1.05$   
1568 reflections118 parameters  
 $\Delta\rho_{\text{max}} = 1.28$  e Å<sup>-3</sup>  
 $\Delta\rho_{\text{min}} = -0.90$  e Å<sup>-3</sup>

Table 1

Selected geometric parameters (Å, °).

Ga1—O3 <sup>i</sup>	1.834 (5)	Ga2—O7	1.810 (5)
Ga1—O4 <sup>ii</sup>	1.834 (5)	B1—O1	1.376 (10)
Ga1—O6	1.831 (5)	B1—O2 <sup>v</sup>	1.370 (10)
Ga1—O7 <sup>iii</sup>	1.790 (5)	B1—O3	1.358 (10)
Ga2—O1	1.840 (5)	B2—O4	1.366 (9)
Ga2—O2 <sup>iii</sup>	1.838 (5)	B2—O5	1.395 (9)
Ga2—O5 <sup>iv</sup>	1.832 (5)	B2—O6 <sup>iii</sup>	1.341 (10)
O7 <sup>iii</sup> —Ga1—O6	110.8 (2)	O7—Ga2—O1	112.5 (2)
O7 <sup>iii</sup> —Ga1—O4 <sup>ii</sup>	110.4 (2)	O5 <sup>iv</sup> —Ga2—O1	109.3 (2)
O6—Ga1—O4 <sup>ii</sup>	114.5 (2)	O2 <sup>iii</sup> —Ga2—O1	105.7 (2)
O7 <sup>iii</sup> —Ga1—O3 <sup>i</sup>	110.4 (2)	O3—B1—O2 <sup>v</sup>	119.4 (7)
O6—Ga1—O3 <sup>i</sup>	105.7 (2)	O3—B1—O1	117.8 (8)
O4 <sup>ii</sup> —Ga1—O3 <sup>i</sup>	104.8 (2)	O2 <sup>v</sup> —B1—O1	122.7 (7)
O7—Ga2—O5 <sup>iv</sup>	109.3 (2)	O6 <sup>iii</sup> —B2—O4	124.7 (7)
O7—Ga2—O2 <sup>iii</sup>	109.5 (2)	O6 <sup>iii</sup> —B2—O5	116.3 (7)
O5 <sup>iv</sup> —Ga2—O2 <sup>iii</sup>	110.6 (2)	O4—B2—O5	119.0 (7)

Symmetry codes: (i)  $x, -y + \frac{1}{2}, z - \frac{1}{2}$ ; (ii)  $x + 1, y, z$ ; (iii)  $-x + 1, -y, -z + 1$ ; (iv)  $x, -y + \frac{1}{2}, z + \frac{1}{2}$ ; (v)  $x, y, z + 1$ .

Data collection: SMART (Bruker, 2005); cell refinement: SAINT-Plus (Bruker, 2003); data reduction: SAINT-Plus; program(s) used to solve structure: SHELXTL (Sheldrick, 2008); program(s) used to refine structure: SHELXTL; molecular graphics: DIAMOND (Brandenburg & Putz, 2007); software used to prepare material for publication: SHELXTL.

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Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: MG2048).

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