

Tetrapotassium diantimony(III) tin(IV) tetradecafluoride

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Received 28 April 2008; accepted 1 May 2008

Key indicators: single-crystal X-ray study; $T = 298$ K; mean $\sigma(\text{Sn}-\text{F}) = 0.002$ Å; R factor = 0.038; wR factor = 0.091; data-to-parameter ratio = 47.3.

The title compound, $\text{K}_4\text{Sb}_2\text{SnF}_{14}$, is built from anionic layers, with an overall composition of $[\text{Sb}_2\text{SnF}_{14}]^{4-}$ extending parallel to the ac plane, and K^+ cations. The layers are made up from vertex-sharing centrosymmetric SnF_6 octahedra and Sb_2F_{12} dimers. The Sn–F distances are in the range 1.9581 (14)–1.9611 (17) Å. The Sb polyhedra contain three short terminal Sb–F bonds [1.9380 (14)–2.0696 (15) Å], one short bridging bond [2.0609 (17) Å], one bridging bond of medium length [2.7516 (15) Å], and two longer bridging bonds [3.0471 (18) and 3.117 (2) Å]. The K^+ ions are coordinated by F atoms with coordination numbers 10 and 8, and K–F bond lengths are in the range 2.6235 (16)–3.122 (2) Å.

Related literature

For related literature, see: Blatov (2004); Davidovich & Zemnukhova (1975); Gillespie (1970); Kriegsmann & Kessler (1962); Serezhkin *et al.* (1997).

Experimental

Crystal data

$\text{K}_4\text{Sb}_2\text{SnF}_{14}$	$\gamma = 115.323$ (1)°
$M_r = 784.59$	$V = 346.53$ (2) Å ³
Triclinic, $P\bar{1}$	$Z = 1$
$a = 6.7356$ (2) Å	Mo $K\alpha$ radiation
$b = 7.4704$ (2) Å	$\mu = 7.00$ mm ⁻¹
$c = 7.6370$ (2) Å	$T = 298$ (2) K
$\alpha = 92.691$ (1)°	$0.4 \times 0.35 \times 0.28$ mm
$\beta = 91.461$ (1)°	

Data collection

Bruker SMART 1000 CCD area-detector diffractometer	7147 measured reflections
Absorption correction: Gaussian (<i>XPREP</i> and <i>SADABS</i> ; Bruker, 2003)	4635 independent reflections
$T_{\min} = 0.136$, $T_{\max} = 0.291$	4250 reflections with $I > 2\sigma(I)$
	$R_{\text{int}} = 0.024$

Refinement

$R[F^2 > 2\sigma(F^2)] = 0.037$	98 parameters
$wR(F^2) = 0.090$	$\Delta\rho_{\text{max}} = 1.91$ e Å ⁻³
$S = 1.30$	$\Delta\rho_{\text{min}} = -3.69$ e Å ⁻³
4635 reflections	

Table 1

Selected bond lengths (Å).

Sb–F1	1.9380 (14)	K1–F3 ^{iv}	2.8390 (18)
Sb–F3	1.9539 (13)	K1–F5 ^{iv}	2.8578 (16)
Sb–F4	2.0609 (17)	K1–F1	2.9262 (15)
Sb–F2	2.0696 (15)	K1–F3	2.9485 (18)
Sb–F4 ⁱ	2.7516 (15)	K1–F4 ^{vi}	2.982 (2)
Sb–F5 ⁱⁱ	3.0471 (18)	K1–F7 ^{vi}	3.122 (2)
Sb–F6	3.117 (2)	K2–F2 ^{vii}	2.6662 (15)
Sn–F5	1.9581 (14)	K2–F2 ^v	2.6777 (18)
Sn–F7	1.9611 (17)	K2–F3 ^{iv}	2.7136 (15)
Sn–F6	1.9611 (16)	K2–F1	2.7216 (15)
K1–F4 ^{iv}	2.6235 (16)	K2–F7 ^{viii}	2.7620 (19)
K1–F2	2.7086 (14)	K2–F7 ^{ix}	2.8795 (17)
K1–F1 ^v	2.7268 (16)	K2–F6 ⁱ	2.8943 (16)
K1–F6 ^{vi}	2.811 (2)	K2–F5 ^{iv}	2.9912 (18)

Symmetry codes: (i) $-x + 1, -y, -z + 1$; (ii) $x - 1, y, z$; (iii) $-x + 2, -y, -z$; (iv) $-x + 2, -y + 1, -z + 1$; (v) $-x + 1, -y + 1, -z + 1$; (vi) $x, y + 1, z$; (vii) $x, y, z + 1$; (viii) $-x + 2, -y, -z + 1$; (ix) $x, y + 1, z + 1$.

Data collection: *SMART* (Bruker, 1998); cell refinement: *SAINTE* (Bruker, 2003); data reduction: *SAINTE*; program(s) used to solve structure: *SHELXTL* (Sheldrick, 2008); program(s) used to refine structure: *SHELXTL*; molecular graphics: *XP* in *SHELXTL*; software used to prepare material for publication: *publCIF* (Westrip, 2008).

The authors thank the Russian Foundation for Basic Research (project No. 08-03-00355) for financial support.

Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: FI2062).

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