Neue Barium-Oxoantimonate(III):
Darstellung und Kristallstruktur von Ba$_3$[SbO$_3$]$_2$ und Ba$_2$[Sb$_2$O$_5$]

New Barium Oxoantimonates(III): Synthesis and Crystal Structures of Ba$_3$[SbO$_3$]$_2$ and Ba$_2$[Sb$_2$O$_5$]

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The barium oxoantimonates(III) Ba$_3$[SbO$_3$]$_2$ (triclinic, $P\overline{1}$, $a = 615.2(8)$, $b = 981.4(3)$, $c = 1215.4(5)$ pm, $\alpha = 74.683(9)$, $\beta = 89.710(6)$, $\gamma = 71.464(7)^\circ$, $Z = 2$, $R1 = 0.0802$) and Ba$_2$[Sb$_2$O$_5$] (orthorhombic, $Cmcm$, $a = 401.0(3)$, $b = 1450.6(7)$, $c = 636.6(6)$ pm, $Z = 4$, $R1 = 0.0589$) have been synthesized from melts of elemental barium and antimony oxide Sb$_2$O$_3$ at a temperature of 800 °C. Their oxoantimonate building units are strongly influenced by the stereochemically active lone pair electrons of the pentel element: In the Ba rich compound Ba$_3$[SbO$_3$]$_2$, isolated $\psi$ tetrahedra [SbO$_3$]$^{3-}$ are present, in Ba$_2$[Sb$_2$O$_5$], which crystallizes with the Sr$_2$Bi$_2$O$_5$ structure type, two of these $\psi$ tetrahedra are condensed to form nucelar units [Sb$_2$O$_5$]$^{4-}$. The two compounds are compared in terms of structure and bonding with the alkali antimonates on one hand and with the alkaline earth bismutates on the other.

Key words: Antimonates, Barium, Oxopentelates