Die neuen Oxoarsenate(III) $AAsO_2$ (A = Na, K, Rb) und $Cs_3As_5O_9$. Darstellung, Kristallstrukturen und Raman-Spektren

The New Oxoarsenates(III) $AAsO_2$ (A = Na, K, Rb) and $Cs_3As_5O_9$.
Synthesis, Crystal Structures and Raman Spectra

Franziska Emmerling und Caroline Röhr

Institut für Anorganische und Analytische Chemie, Univ. Freiburg, Albertstr. 21, D-79104 Freiburg
Sonderdruckanforderungen an Prof. Dr. C. Röhr. E-mail: caroline@ruby.chemie.uni-freiburg.de

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The new alkaline metal arsenates(III) were synthesized at a temperature of 500 °C *via* reaction of stoichiometric mixtures of the elemental alkali metals A and As_2O_3. In the crystal structures of the four title compounds, which have been determined by single crystal x-ray diffraction, the As(III) atoms are in ψ-tetrahedral coordination by oxygen exclusively. In $NaAsO_2$ (orthorhombic, space group *Pbca*, $a = 1429.6(9)$, $b = 677.3(3)$, $c = 509.1(2)$ pm, $Z = 8$) and the compounds $AAsO_2$ (A = K/Rb, orthorhombic, space group *Pbcm*, $a = 715.1(2)/729.7(5)$, $b = 748.0(1)/775.2(5)$, $c = 539.20(17)/541.1(3)$ pm, $Z = 4$) the AsO_3 ψ-tetrahedra are condensed to form zig-zag chains $[AsOO_{2/2}]^-$. In the Cs phase $Cs_3As_5O_9$ with a lower alkaline metal content (trigonal, space group $P31m$, $a = 845.5(3)$, $c = 602.6(2)$ pm, $Z = 1$) the two crystallographically independent ψ-tetrahedra $AsO_{3/2}$ and $AsOO_{2/2}$ are connected in a 2:3 ratio to give polar sheets $[As_5O_9]^{3-}$.

Key words: Oxoarsenates, Arsenates(III), Lone-Pair Cations