THE CRYSTAL STRUCTURES OF K AND
Sb(III) SILICATES, K₂Sb(OH)(Si₄O₁₁)₀ and
K₂Sb₂₀(Si₄O₁₅). By V.V. Bakakin, V.P. Balko,
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The crystal structures of dipotassiumantimo-
ny(III)hydro-tetrasilicate, K₂Sb(OH)(Si₄O₁₁)₀
(I), and dipotassiumantimony(III)oxohexasi-
licate, K₂Sb₂₀(Si₄O₁₅)₀ (II), have been deter-
mined. I is monoclinic, a = 6.362, b = 10.954,
c = 15.248 Å, β = 100.63°, space group P2₁/n,
Z = 4. II is monoclinic, a = 8.420, b = 7.760,
c = 9.062 Å, β = 102.4°, space group
P2₁/n, Z = 4. Both structures were solved by the
direct and Fourier methods using the diffrac-
tometer Syntax-P2₁, data and refined to the R-
values of 0.068 and 0.078, respectively. The
structures contain two-dimensional silica-
oxygen motifs of topologically new type:
(Si₄O₁₁)₀ → (Si₄O₁₅)₀ and (Si₄O₁₁)₀ → (Si₁₂₂O₃₀)²⁻.
In the structure I the "vlasovite"-like chain,
Si₁₂₂O₃₀, join forming a stepped corruga-
ted net, parallel to (001). The Sb⁴⁺ atoms
have tetragonal-pyramidal environments (Sb-
OH is 1.98 Å and Sb-O is 2.16-2.25 Å), a lone
pair E(Sb) playing a role of a sixth ligand
in the trans-configuration with the OH. Both
K atoms are seven-coordinated (K-0 is 2.63-
3.19 Å). In general features this structure is
compared with that of vlasovite,
Na₂₂Sb₂O₁₁.

The net of the structure II (with a pseudo-
symmetry 02/m) can be represented as a linkage
of two four-membered haradaite-like chains
stretched along the b axis and one four-mem-
bred ring: Si₁₂₂O₁₂ (the chain) + Si₁₂₂O₁₂
(the chain) + Si₁₂₂O₁₂ (the ring) - O₆ =
Si₁₂₂O₃₀ (the net). These greatly corrugated
nets, parallel to (001), are linked along the
axis c by two SbO₃ half-octahedra sharing
the face. The Sb-O distances range from 1.97
to 2.40 Å. The channel cavities of three ty-
pes contain one lone pair E(Sb), two lone
pairs E(Sb) and four K atoms, respectively,
with the K-K distances of 3.25-3.35 Å.

Several types were synthesized and kindly pro-
vided by M.N. Tseytlin and Kh.M. Kurbanov
(Phys.-Tech. Inst., Acad. of Sci. of Tadj.
SSR, Dushanbe) along with preliminary crys-
tallographic characteristics and an approxi-
mate chemical formula. The initial observed
data have been obtained with the assistance of
Yu.V. Gatilov (Inst. of Chemistry, Siberian
Branch of the Academy of Sciences of the
USSR, Novosibirsk).

CRYSTAL STRUCTURAL STUDIES OF NEW
MIXED P(61)-Mo-V HETEROPOLYCOMPOUNDS
OF THE TWELFTH INTERNATIONAL
CONFERENCE ON CHEMISTRY OF HETER-
OSPHERIC COMPOUNDS. By E.V. Klevtsova,
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The crystal structures of three heteropolycom-
ounds with the different Mo/V ratios have been
determined. The crystal data are:
(I)-tetragonal H₂[SiMo₁₁V₁₀O₃₀] (30-36)H₂O;
d = 12.791, c = 18.131 Å, Z = 2, Pmnm,
(II)-monoclinic Na₄H₆(NaMo₆V₁₀O₃₀)₆H₂O; a = 13.667,
b = 15.260, c = 11.529 Å, Z = 2, P2₁/m,
(III)-monoclinic Na₄H₆(VO)[PMo₄V₁₀O₃₀]₂H₂O;
a = 10.870, b = 21.312, c = 11.654 Å, Z = 2, P2₁/m.

The metal atoms (Mo and V) in the Heteropoly-
anions are statistically distributed according
to the law of pseudo-Keggin(I) and Keggin(II
and III) structures. In all these structures the
anions are connected through water molecules
by weak hydrogen bonds and in the structures
II and III, in addition, by the Na⁺ cations.
A characteristic feature of the structure III
is the presence of the V⁴⁺ group linked to four
0 cis-atoms of the anion. The way of the anion
bonding to the outer sphere cations compensate
its charge is considered.

NEW HEXAGONAL FLUOROPEROVKITES
WITH CATION DEFICIENCY. By E.Hertweck,
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Numerous hexagonal polytypes of perovskites
have been found. Their structural features
have been connected with the stacking peri-
docity of the anionic layers, leading to the
2H, 3C, 6H, 12R and 12T types.

Investigation of ternary systems BaF₂-2AF-MF₂
( A = K, Rb, Cs; M = Ni, Fe ) and RbF-MF₂-MF₃
( M¹=[Ni²⁺]× Fe ) reveals the existence of two
new types of quaternary fluorides: Ba₂M₂F₇
and Rb₂M₄F₉. Crystals are grown under hydrothermal high-
pressure conditions (300°C, 1/2h, HF/acid,
RbF/MF₂/MF₃) for the latter system and from
molten salts. Table 1 summarizes the crystal
data received from single crystal structure
determinations. The crystal structures of these
compounds are closely related to the 9R-CsCoF₃-
type and to the 12R-Cs₂NaCrF₆-type respective-
ly. All X-ray diffraction experiments per-
formed on these phases have shown the presence of