NEW MINERAL NAMES*

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Bystrite*


Microprobe analysis combined with coulometry (H2O) and various traditional techniques (total and sulfic sulfur) gave SiO2 33.37, Al2O3 26.74, CaO 5.10, Na2O 14.42, K2O 7.63, S 12.03, SO3 0.50, CO2 0.32, Cl 0.25, H2O 1.62, O = S, and Cl 2.06, sum 99.92 wt%, corresponding to (Ca0.10Na0.10K0.30)27.98(Si6.17Al5.83)23.12O24(S3)1.39SO40.07Cl0.08(CO2)0.08H2O. Readily soluble in dilute acids, producing H2S. After heating in air at 800 °C becomes dark green. Single-crystal X-ray structural study (R = 0.078) showed the mineral to have trigonal symmetry, space group P31c, a = 12.855, c = 10.700 Å. The strongest lines of the powder pattern (49 given) are: 4.824(70,102), 3.919(80,211), 3.720(100,300), 2.84(90,082), and 2.60(80,420). The mineral occurs in the Malo-Bystinsky deposit, Pribaikal area, Russia, where it forms yellow, tabular crystals up to 5 mm long, closely intergrown with lazurite, calcite, and diopside; also occurs as irregular grains and aggregates. Type material is at the Fersman Mineralogical Museum, Moscow, Russia. J.P.

Kaluginite


Microprobe analysis gave Mn 10.07, Ca 4.76, Mg 5.92, Fe 11.95, Al 0.8, P 16.18, H2O (by weight loss) 20.78 wt%, corresponding to (Mn, Ca)Mg2+4Fe2+(PO4)3(OH)·4H2O. The mineral forms platy crystals up to 0.5–1 mm, flattened [100], slightly elongate [001], showing {001}, {100}, {010}, {111}, and {211}. Light yellowish green to greenish yellow, transparent to translucent, vitreous to greasy luster, white streak with a yellowish tint, brittle, uneven fracture, H = 3.5, imperfect {010} cleavage, Dmax = 2.69, Dcalc = 2.70 g/cm3. Optically biaxial negative, α = 1.627, β = 1.642, γ = 1.658, 2V max = 90°, X = b, Y = a, Z = c, dispersion r > v; distinctly pleochroic, Z = greenish yellow, X and Y almost colorless. Orthorhombic symmetry, a = 15.05, b = 37.37, c = 7.18 Å, space group Ccca, Z = 16. Strongest lines of the X-ray pattern are 9.38(100,040), 5.00(70,221), 3.52(70,022), 2.84(90,082), and 2.60(80,420). The mineral occurs in a granitic pegmatite vein in Ilmenskij National Park, Urals, Russia, and is associated with products of decomposition of tripleite, francolite, ushkovite, matveevite (which see), and iron and manganese hydroxides. The name is for mineralogist A.V. Kalugin.

Discussion. Data are from the abstract by Kydryashova and Rozhdestvenskaya. The original paper by B.V. Chesnokov, V.A. Vilisov, V.O. Polakov, and A.F. Bushmak in, published in the book Mineraly i mineralnoe syre gorno-promyshlennykh rajonov Urala, could not be obtained. The mineral was submitted to the CNMMN in 1983, but the vote was suspended and the name has not been approved. See also the abstract for matveevite. J.P.

[The original paper has since been obtained and data from it are incorporated in the above abstract — Ed.]

Luberoite*


Electron microprobe analysis gave Pt 75.76, Se 24.24 wt%, and that of a PtSe2 standard gave Pt 75.54, Se 24.46 wt%, corresponding well to Pt,Se. Occurs as dark bronze, metallic, idiomorphic crystals, and fragments up to 0.5 mm, and as round to irregular grains in Pt. Some grains are prismatic, polycrystalline twinned; cleavage parallel to {011}, VHN1.5 = 461 (322-620), polishing hardness near that of Pt, Dmax = 10.68-12.78, Dcalc =...
Olekmintske*


Microprobe analyses (CO₂ calculated, five crystals analyzed, 17 analyses given) gave SrO 49.86, CaO 6.68, BaO 11.23, La₂O₃ 0.21, Ce₂O₃ 0.56, CO₂ 29.94, sum 98.48 wt%, corresponding to Sr₁.₄₁₅Ca₂₅₁Ba₂₅₁La₀.₀₀₄Ce₀.₀₁₀(̅CO₃)₂. Small amounts of FeO (0.00–0.27), MnO (0.04–0.19), and MgO (0.00–0.02 wt%) were found. The mineral forms needlelike crystals, 0.005–0.010 mm thick, occurring in spherulitic aggregates 0.10–0.15 mm in radius. The crystals are round to hexagonal in cross section; their centers are enriched in Ca and Ba, and the rims in Sr. Transparent, brittle, H = 3, luster vitreous, Dmax = 3.70(2), Dcalc = 3.650–3.682 g/cm³. In thin section, transparent, straight extinction, uniaxial negative, ω = 1.670(2), ε = 1.527(2), negative elongation. There exists a range of compositions between the new mineral and paralstonite. Hexagonal symmetry and space group P321 were assumed by analogy with paralstonite. X-ray powder study gave a = 8.66(2), c = 6.08(2) Å; strongest lines (20 given) are 3.50(80), 2.49(90), 2.03(90), and 1.305(70, diffuse). The mineral occurs in barytocalcite-quartz veins of 5–10 cm width that cut intrusive breccias accompanying the alkaline Kedrovoyj massif, Aldan Shield, Siberia, Russia, located close to the Murunskij alkaline complex. Associated minerals are calcite, barite, and ankerite that replaced barytocalcite. The name is for the city Olekminsk, the administration center of the Murunskij alkaline complex. The repository for type material was not given.

Padmaite*


Microprobe analysis (30 given, nine samples analyzed) gave Pd 25.70, Pt 1.20, Bi 53.60, Ag 0.80, Au 0.00, Se 18.80, S 0.20, sum 100.30 wt%, corresponding to Pd₀.₉₆₆₅Pt₀.₀₂₂Bi₁.₀₂₂Ag₀.₀₃₉Se₀.₉₄₅S₀.₀₂₂, ideally PdBiSe. Occurs as isometric, irregular grains up to 0.2 mm in diameter, and as symplectic intergrowths with palladium sulfides up to 0.01–0.02 mm. Light yellow color, metallic luster, H = 3–4, microhardness 260–272 kg/mm² (20-g load), imperfect cleavage in two perpendicular directions, Dcalc = 9.86 g/cm³ with Z = 4. Pinkish yellow in reflected light, isotropic, no internal reflection. Reflectance measure-
ments (in air, 20-nm intervals from 400 to 700 nm, %): 46.5, 45.4, 44.9, 46.6, 48.0, 49.0, 48.6, 48.3, 47.7, 46.8, 46.0, 45.4, 45.3, 45.6, 45.6, 48.7, 51.4. X-ray powder study showed the mineral to be cubic, $a = 6.448(3)$ Å, space group (by analogy with synthetic PdBiSe) $P4_332$ or $P4_321$. Strongest lines of the powder pattern (19 given) are 2.89(100, 210), 2.63(90, 211), 1.943(90, 311), 1.724(50, 321), and 1.376(40, 332).

The mineral occurs in metasomatic rocks formed in shungite-bearing metasahales of Lower Proterozoic age, Padma River, southern Karelia, Russia. Associated minerals are clausenthalite, paraguanaquaitite, bohdanowiczite, sobolevskite, froodite, hematite, native Bi and Au, roscoelite, chromium phengite, dolomite, and quartz. The new name is for the locality. Type material is at the Mining Museum of the Leningrad Mining Institute, Russia.

J.L.J.

Simferite*


The mineral occurs at the contact of REE-bearing pegmatite and phlogopitized tremolite rock as dark red aggregates up to 3 mm. Individual crystals are up to 0.1 mm in size and are commonly twinned. Optical properties and chemical composition vary: $\alpha = 1.690–1.704$, $\beta = 1.702–1.716$, $\gamma = 1.712–1.726$. $D_{\text{meas}} = 3.22–3.25$, $D_{\text{calc}} = 3.25$ g/cm$^3$ with $Z = 4$. X-ray data show the mineral to be orthorhombic, $a = 4.7468(7)$, $b = 10.101(2)$, $c = 5.8992(7)$ Å, space group $Pbnm$ or $Pbnc2_1$. The chemical formula is given as $\text{Li}_{0.5} \text{(Mg}_{0.63}\text{Fe}_{0.37}\text{Mn}_{0.5})[\text{PO}_4]_3$.

**Discussion.** An approved name, but an incomplete description. J.P.

Tinnunculite


Chemical analysis gave O 33.20, C 30.70, N 29.00, H 3.24, K 2.25, Na 0.18, S 0.25, ash 1.24, sum 100.06 wt%, corresponding to $\text{C}_{33}\text{H}_{16}\text{Na}_{4}\text{O}_{5}$. (K, Na, S, and ash assumed to be admixed). Mass, paramagnetic resonance, and infrared spectrometric results suggest that the mineral is a product of dimer condensation of uric acid with low-temperature separation of a low-molecular part during oxidation; thus the formula is $\text{C}_{33}\text{H}_{16}\text{Na}_{4}\text{O}_{5}$. In a closed tube yields H$_2$O, later rich black and white deposits. X-ray and electron-diffraction studies showed the mineral to be orthorhombic, $a = 15.08(1)$, $b = 12.56(1)$, $c = 34.64(10)$ Å, $Z = 18$, $D_{\text{calc}} = 1.695$, $D_{\text{meas}} = 1.731$ g/cm$^3$. Strongest lines of the X-ray pattern are 4.24(20,026), 3.77(10,400), 3.21(10,420), 1.774(20,822), and 1.608(30,840). Strongest lines of the electron diffraction polycrystalline pat-
tern are 5.00(40.024), 4.78(40.221), 3.22(100.420), and 3.14(80.040). Occurs as plates up to 0.4 × 3 × 4 cm that consist of very fine-grained particles shown by SEM to be platy crystals with a perfect cleavage parallel to the plates. Yellowish white color, yellowish white streak, dull luster, earthy to conchoidal fracture. Refractive index close to 1.523; X parallels the longer edge of the rectangular plates, Y parallels the shorter edge, and Z is perpendicular to the flattening and cleavage. Occurs in the burned dump in the Chelyabinsk coal basin, Russia. The name is for *Falco tinnunculus*, the Latin term for kestrel (a European falcon). The mineral formed as a product of hot gases from a burning coal dump reacting with excrement from *Falco tinnunculus*.

**Discussion.** The mineral and name were submitted to the CNMMN and were not approved. J.P.

(Zn,Cu,Fe)S


Ten electron microprobe analyses gave an average and (range) of Zn 54.29 (53.40–55.60), Fe 6.56 (6.17–6.86), Cu 6.46 (6.17–6.78), Pb 0.31 (0.02–0.66), Cd 0.20 (0.00–0.38), Co 0.02 (0.00–0.04), S 32.32 (31.42–32.95), sum [100.16] (98.85–101.50) wt%, corresponding to (Zn0.84–Fe0.11Cu0.09S)0.94S, ideally (Zn,Cu,Fe)S. Analysis of coexisting sphalerite gave Zn 57.23, Fe 0.05, Cd 0.31, Co 0.032, In 0.34, Mn 0.24, Bi 0.011, As <0.21, S 29.87, sum 97.07 (97.074) wt%, corresponding to (Zn0.95–Fe0.05)S. Color black, metallic luster, opaque, non-magnetic, H = 165–214 kg/mm² (Mohs 3.5–4), harder than sphalerite. In reflected light, gray with a slight bluish tint and slightly yellowish brown relative to sphalerite; weakly anisotropic with polarization colors from dark gray to gray with a weak bluish tint to brown. Reflectance percentages (SiC standard) gave R% 19.80 (405 nm), 19.65 (436), 19.01 (480), 18.85 (526), 18.23 (546), 17.80 (589), 17.31 (644), and 16.10 (656); the dispersion curve is similar to that of sphalerite but is slightly higher (by <2%); Rm 18.21, x = 0.3243, y = 0.3273, λd = 483 nm, Pm = 0.035. The X-ray powder pattern (six lines listed, Cu radiation) was indexed on a cubic cell analogous to that of sphalerite to yield a = 5.4084(6) Å; diffraction lines are 3.1080(100,111), 1.9060(50,220), 1.6280(30,311), 1.2400(20,331), 1.1030(20,422), and 1.0400(20,511). Backscattered electron X-ray images indicate that the elements, including Cu, are homogeneously distributed.

The mineral occurs sparingly and intermittently as aggregates of anhedral grains in interstices between chalcopyrite-sphalerite aggregates and along chalcopyrite-sphalerite grain boundaries that occur in veinlets 2–3 cm wide and of variable length. The veinlets are in a sphalerite-galena-chalcopyrite skarn orebody near Huang Gan Ling, Inner Mongolia.

**Discussion.** For comparison the authors give their X-ray data for an Fe-bearing sphalerite (8.78 wt% Fe); diffraction lines at 2.693(10,200) and 1.5603(10,222) for sphalerite are not present in the Cu-rich phase, but the authors do not make an issue of this. Determination of the cell dimensions and symmetry by single-crystal X-ray study or another direct method is needed to prove that the mineral is new. J.L.J.

Fe₃(OH)₄Cl


The mineral was found in partly serpentinized tructolites in several drill cores from the Duluth Complex, where it occurs as vein fillings up to 700 µm long and 100 µm wide. Megascopically visible on the surface of the drill core as a rusty red alteration thought to have formed by reaction with the atmosphere. Colorless in transmitted light, but increasingly yellow-reddish with oxidation; n = 1.6–1.7, one distinct parting or cleavage, soluble in H₂O or alcohol. Bireflectant in reflected light, showing bubbles formed by exposure to atmospheric moisture. Electron microprobe analyses of five samples gave Fe 49.05, Mn 1.77, Mg 2.54, Si 0.10, Al 0.01, Cl 16.87, OH (by difference) 30.71, sum 100 wt%, corresponding to Fe₃Mg₀.012Mn₀.005Si₀.004Cl₀.477(OH)₁₀.₁₀, possibly (Fe,Mg)₃Cl₂(OH)₄.


Mg[(UO₂)(AsO₄)]₂·4H₂O


The mineral occurs as yellow plates, flattened [001], that appear as acicular groups in cavities in nickele at the Talmessi Cu mine, Anarak, Iran. Single-crystal X-ray structural study (R = 0.063) gave monoclinic symmetry, space group C2/m, a = 18.207(5), b = 7.062(3), c = 6.661(3) Å, β = 99.65(5)°, Z = 2, D°calc = 3.6 g/cm³.

**Discussion.** No mention is made of the mineralogical relationships, but this may be the monoclinic polymorph of metanovacekite, which is tetragonal. J.L.J.

**New Data**

**Ferrocarnpholite**

Carpholite of composition \((\text{Fe}_{0.76}\text{Mg}_{0.24})_2\text{Al}_2\text{Si}_4\text{O}_{12}(\text{OH})_8\) was structurally refined \((R = 0.025)\) by the single-crystal X-ray method: \(a = 13.797(9)\), \(b = 20.20(2)\), \(c = 5.116(5)\) Å, orthorhombic space group \(\text{Ccca}\). A few weak reflections violate the space group, the mineral has optically inclined extinction, and the Raman spectrum has three (rather than two) OH stretching bands, indicating that the true symmetry is monoclinic, probable space group \(\text{P}2_1/c\) or \(\text{Pc}\). It is concluded that order-disorder involving H atoms, and cation or anion impurities in two large cavities in the structure can produce a lower symmetry, which is negligible for X-ray diffraction but is sufficient to alter optical and spectroscopic properties. J.L.J.

**Klyuchevskite**


Electron microprobe redetermination of the composition of klyuchevskite (Abs., Am. Mineral. 75, 1210–1211, 1990) gave the formula \(K_{3.00}(\text{Cu}_{3.03}\text{Pb}_{0.02})_{23.07}(\text{Fe}_{0.777}\text{Al}_{0.223})_{20.987}\text{O}_{19.98}\). Single-crystal X-ray structural study \((R = 0.12)\) gave monoclinic symmetry, space group \(\text{I}2\), \(D_{\text{obs}} = 2.98\) g/cm\(^3\). The space group is newly specified, as is the presence of Al rather than Cu in the trivalent position. Klyuchevskite is structurally related to pipyite. J.L.J.

**Komkovite**


Single-crystal X-ray structural refinement of komkovite showed its (new) space group to be \(\text{R}32\), chemical formula \(\text{BaZr[Si}_3\text{O}_9\cdot2.4\text{H}_2\text{O}}\); \(D_{\text{obs}} = 3.31\) g/cm\(^3\), identical to the previously reported measured value (Am. Mineral. 77, 207–208, 1992). J.P.

**Laumontite**


X-ray powder diffraction study of laumontite from Meshishodomari, Hokkaido, Japan, showed that the number of H\(_2\)O molecules per formula unit changes from 12H\(_2\)O at 0–5% relative humidity, to 14H\(_2\)O at 10–70% relative humidity, to 16–18 H\(_2\)O at 80–100% relative humidity. Calculated cell parameters at 12H\(_2\)O are \(a = 14.71(1)\), \(b = 13.09(1)\), \(c = 7.46(1)\). At 14H\(_2\)O \(a = 14.77(2)\), \(b = 13.09(2)\), \(c = 7.58(2)\), \(\beta = 112.0(1)^\circ\). At 16–18 H\(_2\)O cell parameters vary from \(a = 14.85–14.90\), \(b = 13.19–13.19\), \(c = 7.55–7.55\), \(\beta = 110.7–110.2^\circ\). X-ray powder data are tabulated for the mineral at 0, 50, and 100% relative humidity.

The above H\(_2\)O contents relate to a cell containing 48 O atoms, and for a cell with 12 O atoms \((Z = 4)\) the corresponding H\(_2\)O contents are 3.0, 3.5, and 4.0–4.5.

X-ray single-crystal structural study by Armbruster and Kohler showed that fully hydrated laumontite has 4.5 H\(_2\)O pfu. Structural refinements for a sample in which content was varied from 4.3, 3.6, 2.9, and 2.7 H\(_2\)O showed a decrease in cell volume and an increase in \(\beta\) angle. Dehydration occurs initially with the release of H\(_2\)O linked only by H bonds to the tetrahedral framework and to additional H\(_2\)O; subsequently, small amounts of Ca-bonded H\(_2\)O are also expelled. At the intermediate stage (3.6 H\(_2\)O) the structure has partly occupied H\(_2\)O sites proposed to be related to long-range ordering of H\(_2\)O. J.L.J.

**Russellite**


Neutron powder diffraction and Rietveld refinement of synthetic Bi\(_2\)WO\(_6\), corresponding to the mineral russellite, indicate orthorhombic symmetry, space group \(\text{P}ca_2_1\), \(a = 5.43726(2)\), \(b = 16.430185(5)\), \(c = 5.45842(20)\). \(D_{\text{obs}} = 9.50\) g/cm\(^3\). Strongest lines of the X-ray powder pattern (diffractometer, CuK\(_\alpha\) radiation) are 3.151 (100, 131), 2.738 (29, 060), 2.729 (22, 002), 2.719 (22, 200), 1.926 (19, 202), 1.650 (20, 191), 1.646 (21, 133), and 1.575 (21, 262). Russellite is isostructural with koechlinite, Bi\(_2\)MoO\(_6\). The symmetry, cell parameters, and space group of russellite are new. J.L.J.

**Discredited Mineral**

Katayamalite, Baratovite


Baratovite, named in 1975, has been described as monoclinic, space group \(\text{C}2/c\), composition \(K\text{Li}_3\text{Ca}_7\text{(Ti,Zr)}_2\text{(Si}_6\text{O}_{18})_2\text{F}_2\). Katayamalite, named in 1983, was described as triclinic, composition \((\text{K}_{0.85}\text{Na}_{0.15})\text{Li}_3\text{Ca}_7\text{(Ti}_{1.95}\text{Fe}_{0.05})\text{(Si}_6\text{O}_{18})_2(\text{OH})_{1.76}\text{F}_{0.24}\). The centrosymmetrical triclinic cell for katayamalite, \(a = 9.721, b = 16.923, c = 19.942\) Å, \(\alpha = 91.43, \beta = 104.15, \gamma = 89.84^\circ\), can be transposed to a monoclinic \(\text{C}2/c\) cell to yield \(a = 16.923, b = 9.721, c = 20.909\) Å, \(\alpha = 89.98, \beta = 112.40, \gamma = 89.94^\circ\), in good agreement with the cell for baratovite: \(a = 16.923, b = 9.721, c = 20.909\) Å, \(\alpha = 89.98, \beta = 112.40, \gamma = 89.94^\circ\).
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The crystal structures of katayamalite and baratovite are identical within experimental error. The only available chemical analysis of baratovite indicates that insufficient F is present to justify two atoms of F in the originally proposed ideal formula KLi$_3$Ca$_7$(Ti,Zr)$_2$(Si$_6$O$_{18}$)$_2$O$_{19}$F$_2$, and it is concluded that the ideal formula of baratovite should be KLi$_3$Ca$_7$(Ti,Zr)$_2$(Si$_6$O$_{18}$)$_2$(OH,F)$_2$, which is the same as the formula for katayamalite.

Discussion. It is not suggested which of the two minerals should be discredited, and a proposal has not been submitted to the CNMMN. J.L.J.