**New Mineral Names**

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**BRODTKORBITE**


Electron microprobe analyses gave Cu 26.2, Hg 40.7, Se 32.9, sum 99.8 wt%, corresponding to Cu₂HgSe₂, ideally Cu₂HgSe₂. The mineral occurs as dark gray individual anhedral grains, up to 50 × 100 μm, and as aggregates to 150 × 250 μm. Metallic luster, bristle, dark gray streak, no cleavage or parting, uneven fracture, H = 2½–3, VHN₅₀ = 91.4–131, Dₘₒₒ = 7.77 g/cm³ for Z = 2 and the ideal formula. White in reflected light, weakly to moderately bireflective and anisotropy, rotation tints grayish yellow to mauve-gray. Reflectance per-
vitreous luster, white streak, brittle, hyaline fracture, perfect [100] cleavage, H = 2½, nonfluorescent, D meas. was determined to lie between 1.96 and 2.09, D calc. = 2.037 g/cm³ for Z = 16. Optically biaxial negative, α = 1.6124(3), β = 1.6740, γ = 1.7104(4), 2V meas. = 74(1), 2V calc. = 72.7°, dispersion r < v: Z = b, c ∩ Y = 17°. Single-crystal X-ray structure study (R = 0.0645) indicated monoclinic symmetry, space group C2/c, a = 38.954(2), b = 7.2010(4), c = 16.3645(9) Å, β = 97.602(1); a subcell with a/2 and b/2 is present. Strongest lines of the powder pattern (114 mm Gandolfi, CuKα radiation) are 9.704/(100, 400), 8.117(60,002), 5.843(100,402), 3.139(90, T2,0,2), and 2.920(60,804).

The mineral occurs as coatings, thought to be post-mining, on a sandstone wall at the Firefly–Pigmay mine, which is 16 km east of La Sal, San Juan County, Utah, and which ceased production of U-V ore in 1956. Pascoite, sherwoodite, and native selenium are present in close proximity to the dickthomssenite occurrence. The new mineral name is for geological consultant Richard (Dick) W. Thomassen (b. 1933) of Dayton, Nevada. Type material has been deposited (F. Cureton, written comm. 2002) in the Smithsonian Institution, Washington, DC.

**FEKILCHEVITE***

I.V. Pekov, L.A. Ekimenkova, N.V. Chukanov, R.K. Rastsvetaeva, N.N. Kononkova, N.A. Pekova, A.E. Zadvod (2001) Fedkomblevite, Ni10Ca(Ce3+,Ce2+)2Zr2Nb[Si25O73]((OH),H2O,Cl,O)5. The mineral occurs in a pegmatoidal cancrinite syenite vein at the Kovdor phlogopite, aegirine-diopside, pectolite, titanite, hematite, and pyrrhotite in a pegmatoidal cancrinite syenite vein at the Kovdor phlogopite mine, Kovodor massif, Kola Peninsula, Russia. Distinctive features are the high content and ordered distribution of Ca, the predominance of Fe³⁺ over Fe²⁺, and Nb in M3. The new mineral name is for Russian mineralogist V.G. Feklichev (1933–1999). Type material is in the Fersman Mineralogical Museum, Moscow. **J.L.J.**

**KANONEROVITE***


The mineral occurs as a snow-white crust consisting of aggregates, to 1.2 mm, in which crystals are platy prismatic and a few tenths of a millimeter in length. Electron microprobe analysis gave Na2O 14.80, K2O 0.05, CaO 0.20, MgO 0.14, MnO 11.20, FeO 0.15, P2O5 35.23, H2O (value for the ideal formula) 36.46, sum 98.23 wt%, corresponding to (Mn0.95Mg0.02Fe0.01)2O10(Na2.35Ca0.56K0.01)2O10·12H2O, ideally MnNa3P3O10·12H2O. Crystals are elongate [010], platy [100], also showing [010], platy [100], also showing [010], [010], [203], [423], and [210]. Transparent, vitreous luster, brittle, white streak, H = 2½–3, poor [010] cleavage, no parting, uneven fracture, nonfluorescent, D meas. = 1.91(1), D calc. = 1.90 g/cm³ for Z = 4. Optically biaxial negative, α = 1.453(2), γ = 1.459(2), α ∞ c = 0–7°. Indexing of the X-ray powder pattern (114 mm Debye–Scherrer, FeKα radiation) by comparison with the synthetic analog, for which the crystal structure is known, gave monoclinic symmetry, space group P2₁/n, a = 14.71(1), b = 9.33(1), c = 15.13(2) Å, β = 89.8(1). Strongest lines are 10.50(75,101, 1–01), 7.36(100,200), 3.16(60,411+), and 2.89(60).

The crust occurs on quartz, topaz, and cassiterite, and is locally coated by muscovite and stellerite, in the vuggy, microcline-albite-quartz-muscovite central zone of a pegmatite vein in the Alabashka pegmatite field, Middle Urals (57° 47′ N, 61° 03′ E), Russia. The new mineral name is for mining historian Kanonerov Anatol’evich (b. 1955). Type material is in the Mineralogical Museum, Ilmen Natural Reserve, Miass, Russia. **J.L.J.**

**LABUNTSOVITE GROUP***


The rules for the naming of members of the labuntsovite group of Ti-Nb silicates are presented. Orthorhombic members have a unit cell approximating a ≈ 7.4, b = 14.2, c = 7.1 Å, and the cell for monoclinic members approximates a = 14.3, b = 13.8, c = 7.8 Å, β = 117°. New species with a doubled unit cell are distinguished by the prefix “para.”

**Discussion.** Table 1 is an attempt to summarize the current nomenclature and ideal formulas (Z = 1). Comparison of the empirical versus ideal or simplified formulas for the labuntsovite-group minerals abstracted in this issue will show that the nomenclature scheme is considerably more complex and non-standard than is suggested by the summary. **J.L.J.**

**LABUNTSOVITE-Fe*, LABUNTSOVITE-Mg***

A.P. Khomyakov, G.N. Nechelyustov, G. Ferraris, A. Gula, G. Ivaldi (2001) Labuntsovite-Fe, Na4K2(Ba,K)2(Fe,Mg,Mn)12[(OH)6,Cl0.6,PO4.9.5]]
**TABLE 1.** Nomenclature and idealized formulas (Z = 1) of the labuntsovite group

### Orthorhombic

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nenadkevichite (Pbam)</td>
<td>Na₈Nb₄(Si₂O₁₃)(OH)₂·8H₂O</td>
</tr>
<tr>
<td>Kuzmenkoite-Mn</td>
<td>K₆Mn₄(Si₂O₁₃)(OH)₂·8H₂O</td>
</tr>
</tbody>
</table>

### Monoclinic

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vuoriyarvite subgroup (Cm)</td>
<td>Na₄K₄(Ba,K)₂(Fe,Mg,Mn)²⁺·32(OH)₂·8H₂O</td>
</tr>
<tr>
<td>Kuzmenkoite subgroup (C2/m)</td>
<td>K₆Mn₄(Si₂O₁₃)(OH)₂·8H₂O</td>
</tr>
<tr>
<td>Lemmleinite subgroup (C2/m)</td>
<td>Na₈K₄Ti₄(Si₂O₁₃)(OH)₂·8H₂O</td>
</tr>
<tr>
<td>Labuntsovite subgroup (C2/m)</td>
<td>Na₄K₄Fe₂Ti₄(Si₂O₁₃)(OH)₂·8H₂O</td>
</tr>
<tr>
<td>Gutkovaite subgroup (Cm)</td>
<td>Ca₆K₄Mn₄(Si₂O₁₃)(OH)₂·8H₂O</td>
</tr>
<tr>
<td>Paralabuntsovite subgroup (I/m)</td>
<td>Na₈K₄Fe₂Ti₄(Si₂O₁₃)(OH)₂·8H₂O</td>
</tr>
<tr>
<td>Organovite subgroup (C2/m)</td>
<td>K₆Mn₄(Si₂O₁₃)(OH)₂·8H₂O</td>
</tr>
<tr>
<td>Parakuzmenkoite-Fe</td>
<td>(K,Ba)₆Fe₂Ti₄(Si₂O₁₃)(OH)₂·8H₂O</td>
</tr>
</tbody>
</table>

Name changes: vuoriyarvite renamed vaalinite; kuzmenkoite becomes kuzmenkoite-Mn; lemmleinite becomes lemmleinite-K; labuntsovite becomes labuntsovite-Mn.

### LABUNTSOVITE-Mg

The mineral occurs as prismatic crystals to 3 mm long, elongate [010], and in radial aggregates. Colorless to white, rarely yellowish, pink, or light orange, vitreous, lustrous, transparent to translucent, H = 5, stepped fracture, imperfect cleavage on {001} and another plane, nonfluorescent, Dmeas = 2.88(2), Dcalc = 2.89 g/cm³ for Z = 1. Optically biaxial positive, α = 1.688(2), β = 1.698(2), γ = 1.802(3), 2Vmeas = 37(1)°; orientation and pleochroism as for labuntsovite-Fe, with colorless varieties nonpleochroic. Electron microprobe analysis gave NaO 4.61, K₂O 8.57, CaO 0.03, SrO 0.01, BaO 6.23, FeO 1.49, MgO 1.22, MnO 0.01, Al₂O₃ 0.30, SiO₂ 39.70, TiO₂ 23.96, Nb₂O₅ 3.65, H₂O (calc.) 9.24, sum 99.02 wt%, corresponding to Na₅K₄(H₈O)₂·8.00·7.65H₂O, simplified as Na₆K₄(H₈O)₂·8.00·8.35H₂O. Vitreous, lustrous, translucent to transparent, H = 5, Dmeas = 2.94, Dcalc = 2.93 g/cm³ for the empirical formula and Z = 1. Optically biaxial positive, α = 1.686(2), β = 1.696(2), γ = 1.835(3), 2Vmeas = 32(1)°; orientation α = Z, β = Y, c = X = 27° in obtuse β; pleochroism X = pale yellow, Y = orange. Single-crystal X-ray study indicated monoclinic symmetry, space group C2/m, a = 14.249(6), b = 13.791(6), c = 7.777(2) Å, β = 116.82(3)°. Strongest lines of the powders pattern (diffractogram, CuKα radiation) are 6.95(56,001), 3.169(100, 400, 402, 42T), 3.100(62,022,041), 3.032(53,240,24T), and 2.585(58,241,242).

The mineral occurs in K-feldspar-natrolite-calcite veins with pectolite, fluorite, and aegirine in hydrothermally altered urtite at Mount Kukisvumchorr, Khibiny alkaline massif, Kola Peninsula, Russia. The new name refers to the Fe dominance as a member of the labuntsovite subgroup of the labuntsovite group. Type material is in the Fersman Mineralogical Museum, Moscow.

### LEMMLEINITE-Ba*

The mineral occurs as aggregates in which prismatic crystals are up to 2 cm, showing {001}, {100}, {010}, and {011}. Orange to light coffee-colored, transparent, vitreous luster, white streak, imperfect cleavage, \(D_{\text{meas}} = 3.03(1), D_{\text{calc}} = 3.05(1) \text{ g/cm}^3\). Optically biaxial positive, \(\alpha = 1.683(1), \beta = 1.690(2), \gamma = 1.820(5), 2V_{\text{meas}} = 37(10), 2V_{\text{calc}} = 27(6)^\circ\), medium dispersion \(\rho > \gamma\), pleochroism \(X, Z = \text{colorless}, Y = \text{light brown}\); orientation \(Y = b, Z = a, X = c\), at Mount Karnasurt (type locality), and as crystals to 0.2 mm, and as pseudomorphs after crystals of vuonnemite, up to 0.5 cm, at Maly Punkaruaiv Mountain, Lovozero massif, Kola Peninsula; similarly with kuzmenkoite-Mn, aegirine, arfvedsonite, eudialyte, sodalite, nattrolite, elpidite, cristobalite, steenstrupine-(Ce), rhabdophane-(Ce), and yoforterie at Mount Karnasurt, and calciohblairite, nattrolite, albite, aegirine, vuoriyarvite-K, and kuzmenkoite-Mn at Flora Mountain. The new mineral name is for crystallographer Natalia Ivanovna Organova (b. 1929). Type material is in the Fersman Mineralogical Museum, Moscow.

**TSEPINITE-Na**


Electron microprobe analysis of the Khibiny mineral gave Na2O 5.48, K2O 1.58, CaO 0.18, SrO 2.32, BaO 2.60, ZnO 0.04, Fe2O3 0.25, SiO2 40.38, TiO2 14.17, Nb2O5 20.69, H2O (TGA) 13.18, sum 100.87 wt%, corresponding to H3.43(Na4.12Ti3.12Nb3.34Fe0.43)[Si4O12](OH,HO)2·6H2O for \(Z = 1\), ideally (Na2O,K, Sr, Ba)2(Ti,Nb)2[Si4O12](OH,HO)2·3H2O; for \(Z = 4\). Occurs as colorless, white, and light brown radial aggregates, and as prismatic crystals up to 1 cm long, showing {001}, {010}, and {100}, with some modified by {012} and {241}. Vitreous luster, transparent to translucent, brittle, white streak, \(H = 5\), no cleavage, uneven fracture, \(D_{\text{meas}} = 2.74(2), D_{\text{calc}} = 2.72(1) \text{ g/cm}^3\). Optically biaxial positive, \(\alpha = 1.658(1), \beta = 1.668(1), \gamma = 1.770(5)\) (Khibiny); \(\alpha = 1.655(2), \beta = 1.661(2), \gamma = 1.770(5)\) (Lovozero); \(2V_{\text{meas}} = 19–31^\circ\), nonpleochroic. Single-crystal X-ray structure study (\(R = 0.055\)) indicated monoclinic symmetry, space group \(C2/m\), \(a = 14.551(2), b = 14.001(2), c = 15.702(2) \AA, \beta = 117.584(2)^\circ\). Strongest lines of the powder pattern (diffractometer, MoKα1 radiation) are 6.99(100,020), 6.43(25,200,202), 4.936(28,022), 3.227(89,422, 400, 404), 3.123(68,042,024), 2.607(25,244, 204, 206), and 2.520(29,442, 402, 406).

The mineral, which is a member of the labuntsovite group, has a compositional range in which analytical results extend to formula Ti > Nb. Among the associated minerals are microcline, albite, aegirine, arvedsonite, eudialyte, sodalite, nattrolite, elpidite, cristobalite, steenstrupine-(Ce), rhabdophane-(Ce), and yoforterie at Mount Karnasurt, and calciohblairite, nattrolite, albite, aegirine, vuoriyarvite-K, and kuzmenkoite-Mn at Flora Mountain. The new mineral name is for crystallographer Natalia Ivanovna Organova (b. 1929). Type material is in the Fersman Mineralogical Museum, Moscow.

**ORGANOVAITE-Mn**


The mineral occurs as stubby prismatic crystals, up to 0.3 \times 0.2 mm, and as pseudomorphs after crystals of vuonnemite, up to 4 cm, at Mount Karnasurt (type locality), and as crystals to 0.5 mm at Flora Mountain, Lovozero alkaline massif, Kola Peninsula, Russia. Electron microprobe analysis gave Na2O 0.51, K2O 4.31, CaO 1.06, BaO 1.31, MnO 5.07, FeO 0.24, ZnO 2.04, Al2O3 0.28, SiO2 38.36, TiO2 8.87, Nb2O5 27.97, H2O (TGA, separate sample) 10.40, sum 100.42 wt%, corresponding to \((K2,3Na4.03Ca0.96Nb0.95Ba0.28)\)\((Mn1.77Fe0.19Ti0.9)\)\((Si4O12)\)(Al(OH)4)\(·12.8\)H2O for \(Z = 2\), ideally K3Mn(Nb,Ti)4(SiO4)2(Al(OH)4)·6H2O for \(Z = 1\). Pinkish in various shades, rose-brown, yellow-brown, vitreous luster, transparent to translucent, white streak, brittle, no cleavage, uneven fracture, \(H = 5, D_{\text{meas}} = 2.88(1), D_{\text{calc}} = 2.92(1) \text{ g/cm}^3\). Optically biaxial positive, \(\alpha = 1.683(2), \beta = 1.692(3), \gamma = 1.775(5), 2V_{\text{meas}} = 38^\circ\), weak dispersion, pleochroism \(X, Z = \text{colorless}, Y = \text{light brown}\). Single-crystal X-ray structure study (\(R = 0.049\)) indicated monoclinic symmetry, space group \(C2/m\), \(a = 14.551(2), b = 14.001(2), c = 15.702(2) \AA, \beta = 117.584(2)^\circ\). Strongest lines of the powder pattern (diffractometer, MoKα1 radiation) are 6.99(100,020), 6.43(25,200,202), 4.936(28,022), 3.227(89,422, 400, 404), 3.123(68,042,024), 2.607(25,244, 204, 206), and 2.520(29,442, 402, 406).

The mineral, which is a member of the labuntsovite group, has a compositional range in which analytical results extend to formula Ti > Nb. Among the associated minerals are microcline, albite, aegirine, arvedsonite, eudialyte, sodalite, nattrolite, elpidite, cristobalite, steenstrupine-(Ce), rhabdophane-(Ce), and yoforterie at Mount Karnasurt, and calciohblairite, nattrolite, albite, aegirine, vuoriyarvite-K, and kuzmenkoite-Mn at Flora Mountain. The new mineral name is for crystallographer Natalia Ivanovna Organova (b. 1929). Type material is in the Fersman Mineralogical Museum, Moscow.
PARAKUZMENKOITE-Fe*


The mineral occurs as orange to reddish orange prismatic crystals, to 0.3 × 1 mm. Electron microprobe analysis gave Na₂O 0.43, K₂O 2.86, CaO 0.24, SrO 0.45, BaO 8.76, MgO 0.14, MnO 1.79, FeO 4.86, ZnO 0.21, SiO₂ 37.35, TiO₂ 13.74, Nb₂O₅ 17.59, H₂O (TGA) 10.94, sum 99.36 wt%, corresponding to (K₁.56Na₀.36Ba₁.0₄Sr₀.1₂Ca₀.07)₂(Fe²⁺₃.₅₈Mn₀.₆₅Mg₀.₀₉)₂(Si₄O₁₂)₂(O, OH)₄·14.29H₂O for Z = 2, simplified as (K, Ba)₂Fe(Ti, Nb)₄[Si₄O₁₂]₂(O, OH)₄·7H₂O for Z = 4.

X-ray powder diffraction pattern is in the Fersman Mineralogical Museum, Moscow.

The average of three electron microprobe analyses is Pb₁₀–₂⁺Cu₂⁺Ag₁.₃₄Pb₇.₃₄Bi₁₃.₂₉S₂₉.₅₁ on the basis of 24 cations. The general formula is Cu₂Ag₂Pb₁₀–₂⁺Bi₁₃.₂₉S₂₉ wherein x = 1.23 to 1.49, and the Ag-free member corresponds to Cu₁₂Pb₁₀Bi₁₃S₂₉. The mineral occurs as oriented, elongate patches, some >10 μm wide, within felberrtalite that is associated with numerous Bi sulfosalts in the Funishan skarn deposit, about 25 km east of the city of Nanjing, Jiangsu Province, eastern China.

**Discussion.** The composition is similar to that of the unidentified sulfosalt reported in *Am. Mineral.*, 81, p. 1016 (1996). J.L.J.

(Cu, Co, Ni)₂As₆Se₆


Electron microprobe analysis gave Cu 21.4, Fe 0.3, Ni 4.5, Co 10.6, As 20.5, Se 41.4, sum 98.7 wt%, corresponding to (Cu₃.₅₀Co₂.₀₆Ni₀.₈₈Fe₀.₀₅)₂As₆Se₆. The mineral occurs as crystals, to 0.3 mm. Single-crystal X-ray structure study (R = 0.047) indicated monoclinic symmetry, space group C2/m, a = 14.410(2), b = 13.880(2), c = 15.587(2) Å, β = 117.53(1)°. Strongest lines of the powder pattern are 6.91(100, 020, 002), 7.02(100, 422–, 400, 404–), 7.18(100, 042, 130(6), 2, simplified as (K, Ba)₂Fe(Ti, Nb)₄[Si₄O₁₂]₂(O, OH)₄·7H₂O for Z = 2, simplified as (K, Ba)₂Fe(Ti, Nb)₄[Si₄O₁₂]₂(O, OH)₄·7H₂O for Z = 4. Vitreous luster, translucent, white streak, imperfect cleavage, H = 5, D meas = 3.00(3), D calc = 3.07(1) g/cm³.

Optically biaxial positive, nα = 1.687(1), nβ = 1.689(2), nγ = 1.805(5), 2V meas = 22(10)°, pleochroism X = Y = colorless, Z = pale brown; orientation X = b, Y = c. Single-crystal X-ray structure study (R = 0.047) indicated monoclinic symmetry, space group C2/m, a = 14.410(2), b = 13.880(2), c = 15.587(2) Å, β = 117.53(1)°. Strongest lines of the powder pattern are 6.91(100, 020, 002), 7.02(100, 422–, 400, 404–), 3.09(100, 042, 024), 1.524(90, 480, 484, 426, 42.10), and 1.422(80, several).

The mineral is associated with microcline, aegirine, eudialyte, lorenzenite, sodalite, natrolite, elpidite, ranciéite, and halloysite in alkaline pegmatite at Kedykverpakh Mountain, Lovozero massif, Kola Peninsula, Russia. The new mineral name indicates that the mineral is the Fe-dominant analog of kuzmenkoite-Mn and has a doubled c-axis length. Type material is in the Fersman Mineralogical Museum, Moscow. J.L.J.

Cu₂Ag₂Pb₁₀–₂⁺Bi₁₃.₂₉S₂₉


The average of three electron microprobe analyses is Pb 27.18, Cu 2.35, Fe 0.07, Ag 2.60, Bi 49.61, Sb 0.01, Se 1.79, Te 0.47, S 16.15, sum 100.23 wt%, corresponding to Cu₂₀Ag₁₃Pb₁₃Bi₁₃S₂₉ (based on the basis of 24 cations). The general formula is Cu₇Ag₂Pb₁₀–₂⁺Bi₁₃S₂₉ wherein x = 1.23 to 1.49, and the Ag-free member corresponds to Cu₁₂Pb₁₀Bi₁₃S₂₉. The mineral occurs as oriented, elongate patches, some >10 μm wide, within felberrtalite that is associated with numerous Bi sulfosalts in the Funishan skarn deposit, about 25 km east of the city of Nanjing, Jiangsu Province, eastern China.

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