New Mineral Names*

JOHN L. JAMBOR1† AND ANDREW C. ROBERTS2

1Department of Earth and Ocean Sciences, University of British Columbia, Vancouver, British Columbia V6T 1Z4, Canada
2Geological Survey of Canada, 601 Booth Street, Ottawa K1A 0E8, Canada

ARTSMITHITE*


Electron microprobe analysis gave Hg2O 78.28, Al2O3 5.02, P2O5 11.39, H2O (calc.) 1.63, sum 96.32 wt%, from which the structure-derived formula corresponds to Hg4(PO4)2–(OH)13+x, where x = 0.26. The mineral occurs as a matted nest of randomly scattered fibres, elongate [001] and some >1 mm in length, with length:width >100:1. Colorless, to white in aggregates, translucent, elongate [001] and some >1 mm in length, with

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The mineral occurs as fibrous grains, up to 0.05 mm across and 5 cm long, that form plicated aggregates. Light brown or yellow-brown color, vitreous to silky luster, white streak, brittle, splintery fracture, H = 5, perfect {001} and {010} cleavages, D_meas = 2.85, D_cal = 2.93 g/cm3 for the empirical formula and Z = 4, insoluble in HCl and HNO3 at room temperature. Optically biaxial negative, α = 1.631(2), β = 1.641(2), γ = 1.647(2), 2V_meas = 82°, a = X, c = Y, b > Z = 5° in obtuse γ, pleochroism Y and Z = pale yellow, X = colorless. Wet chemical analysis gave NaO 4.59, K2O 8.53, RbO 0.20, CaO 18.60, SrO 2.75, BaO 2.84, MnO 1.00, FeO 0.88, Fe2O3 0.23, Al2O3 0.32, SiO2 41.96, TiO2 6.52, ZrO2 0.35, Nb2O5 6.56, Ta2O5 0.25, H2O 2.85, F 2.72, Cl (electron microprobe) 0.42, O = FeCl 1.24, sum 100.33 wt%, for which Si + Al = 48 corresponds to (Ca2.66K2.52Na10.08 Si1.86Ba1.42Rb0.18K18.25Ba12.69Mn0.36Fe5.69Fe2O3Ta0.20TiO2O19.32OH20.68F5.76Cl4.69I21.70) simplified as in the title. The presence of OH–H2O is evident in the IR spec-

* Before publication, minerals marked with an asterisk were approved by the Commission on New Minerals and Mineral Names, International Mineralogical Association.
† E-mail: JLJambor@aol.com
trum. Electron diffraction patterns and indexing of the powder pattern (diffractometer, CuKα radiation) indicated monoclinic symmetry, possibly space group P21/m, a = 14.069(3), b = 24.937(5), c = 44.31(2) Å, β = 95.02(4)°; strongest lines are 12.33(51,020), 6.199(42,040), 3.127(65,426), 3.110(52,364), 2.990(59,2.3.12), 2.940(45,24.12), and 2.835(100,428). The structure is astrophyllite-like.

The mineral is associated with nepheline, K-feldspar, biotite, fluorapatite, shcherbakovite, eudialyte, and astrophyllite in a veinlet that cuts nepheline syenite at Mt. Eveslogchorr, Khibiny alkaline massif, Kola Peninsula, Russia. The new mineral name alludes to the locality. Type material is in the Fersman Mineralogical Museum, Moscow, Russia. J.L.J.

GLAGOLEVITE*


Electron microprobe analysis gave Na2O 3.94, MgO 37.23, FeO 0.38, MnO 0.11, Al2O3 13.36, SiO2 29.24, H2O (TGA) 14.5, sum 98.76 wt%, corresponding to Na0.70(Mg5.53Fe0.01Mn0.01Al0.06)(Si2.90Al1.10)Zr0.00O10(OH)2·H2O for Mg + Fe + Mn + Al + Si = 10, ideally NaMg6SiAlO10(OH)2·H2O. The mineral occurs as poikilitic grains up to 3 cm, wherein the inclusions are of vesuvianite. Colorless, transparent, vitreous to pearly luster, indistinct to stepped fracture, perfect {001} cleavage, nonfluorescent, slowly soluble in 10% HCl at room temperature; the IR spectrum differs from that of clinochlore. Optically biaxial positive, α = 1.684(2), β = 1.695(4), γ = 1.718(2), 2Vmeas = 73(2), Vcalc = 76°, orientation X = c, Z = a [100] = ~20°, weak pleochroism, X = colorless, Z = pale yellow. Single-crystal X-ray structure study (R = 0.04) indicated triclinic symmetry, space group P1̅, a = 10.032(2), b = 11.333(2), c = 7.202(1) Å, α = 90.192(4), β = 100.334(5), γ = 111.551(4)°. Strongest lines of the X-ray powder pattern (141 mm Gandolfi, CuKα radiation) are 7.266(30,002), 2.992(40,114–), 2.597(60,131,202–,13–1), 2.457(50,132,13–2,203–), and 2.2016(55,004). The mineral, which is the Ti, Mn analog of rosenbuschite, is associated with nepheline, alkali feldspar, and làvvenite at Hvide Ryg, a mountain of nepheline syenite in the Werner Bjerge range along the eastern coast of Greenland. The new mineral name is for Danish geologist Lauge Koch (1892–1964), who mapped Werner Bjerge. Type material is in the Geological Museum, University of Copenhagen, Denmark. J.L.J.

SAILAUFITE*


The mineral occurs as thinly intergrown, dark red-brown to black, tabular crystals, commonly mammillary, with the aggregates typically <0.5 mm. Electron microprobe analysis gave Na2O 1.76, CaO 11.80, MnO1.23, As2O5 34.92, sum 86.86 wt%, corresponding to (Ca1.33Na0.42Ca)Mn3.24As4.11O16(AsO4)3·3H2O, ideally CaNaMn3O16(AsO4)3·3H2O. The presence of CO2 groups and H2O was confirmed by IR and Raman spectroscopy, and by the crystal-structure determination. Vitreous luster, brown streak, H = 3½, brittle, uneven to conchoidal fracture, perfect {001} cleavage, nonfluorescent, slowly soluble in HCl, Dcalc = 3.356 g/cm3 for Z = 6. Optically biaxial negative, α = 1.757(5), β = 1.8(1.861 nm), 2Vmeas = 32(3)°, orientation X = e*, Y = b, Z = a. Single-crystal X-ray structure study (R = 0.045) indicated monoclinic symmetry, space group Cm; a = 11.267(2), b = 19.717(3), c = 8.949(1) Å, β = 100.22(1)° as refined from a powder pattern (diffractometer, CuKα radiation) with strongest lines of 8.7856(100,001), 5.6524(27,130), 2.9342(75,003), 2.7702(36,400), and 2.2016(55,004). The structure is closely related to that of mitridatite.

The mineral occurs as a late-stage hydrothermal product associated with hausmannite, arseniosiderite, ktnuhorite, dolomite, quartz, and calcite in veins of Mn ore in a rhyolite at

grains, elongate [010], in parallel to subparallel aggregates up to 0.3 x 1.0 mm. Electron microprobe analysis gave Na2O 10.33, CaO 21.39, SrO 0.12, MgO 0.01, MnO 4.92, FeO 1.08, Al2O3 0.05, V2O5 0.03, Y2O3 0.39, La2O3 0.25, Ce2O3 0.57, SiO2 31.55, TiO2 8.44, ZrO2 12.12, H2O 0.09, Nb2O5 1.86, Ta2O5 0.02, F 6.83, O = F 2.88, sum 97.71 wt%, corresponding to (Na0.70Sr0.02Fe2.21Z2 (Na1.75Ca1.23)2Zr0.11O16(Fe0.05Ca0.05)2.00(Na0.029Ca0.02)2.98(Mn0.11Ca0.09)2.00(Y2O3)0.03O16)2.00. The mineral is associated with hausmannite, arseniosiderite, kutnohorite, do-

JAMBOUR AND ROBERTS: NEW MINERAL NAMES

KOCIHE*


The mineral occurs as brownish, lath-shaped to acicular
Hartkopf hill, north of Ober-Sailauf, northwestern Bavaria, Germany. Another occurrence is with managanothemeyerite, tilasite, and calcite in veinlets within massive braunite ore at the Starlera deposit in the Eastern Alps of Switzerland. The new mineral name refers to the type locality. Type material is in the Institut für Mineralogie und Kristallographie der Universität Wien, Vienna, Austria. J.L.J.

SHIROKSHINITE*


The mineral, ideally K(NaMg₂)SiO₆F₂, is the Na-dominant analog of tainiolite, K(LiMg₂)SiO₆F₂. Electron microprobe analysis gave K₂O 10.18, Na₂O 7.01, MgO 19.17, MnO 0.60, CaO 2.56, Ce₂O₃ 0.47, Na₂O 0.03, C. Canet, P. Alfonso, J.-C. Melgarejo, S. Jorge (2003) V-rich symmetrical, space group 

K, Ti ANALOG OF ILMAUSSITE-(CE)


Single-crystal X-ray study of the mineral, from Yukspor Mountain, Khibiny massif, Kola Peninsula, Russia, gave rhombohedral symmetry, space group R₃2, a = 10.708(2), c = 60.073(11) Å, and the newly derived formula given in the title.

Discussion. The revision refers to the crystal structure presented in Doklady Chemistry, 388, 9–13, 2003. The full description of the new mineral has not yet been published, but the data refer to mineral IMA No. 2002–043. J.L.J.

NEW DATA

ALACRANITE


Compositional and X-ray data, including single-crystal structure studies, indicate that alacranite corresponds to As₂S₄–, monoclinic, space group P21/c, whereas the high-temperature form corresponds to As₂S₃, has a smaller cell volume, and crystallizes with the space group C2/c. The As₂S₃ (P2/c) mineral is concluded to be alacranite, sensu stricto, whereas the As₂S₄ mineral (Am. Mineral., 87, p. 357, 2002) is considered to be a new species. J.L.J.

ARSENIOPLEITE


Electron microprobe analysis and single-crystal X-ray structure study (R = 0.023) of a specimen of arseniopleite from the originally described material (Sjö mine, Örebro, Sweden) gave monoclinic symmetry, space group P2/a, a = 6.8113(6), b = 13.0358(11), c = 11.3245(10) Å, β = 100.07(3)°, formula (Ca₀.₆₈Na₀.₃₂)₀₁.₀₀(NO₃₀.₃₂Pbₒ.₀₁)₀₂.₀₀Sbₒ.₁₇Mnₒ.₁₂(As₂.₉₈Pₒ.₅₂Feₒ.₂₇)₀₂.₀₀(As₂S₄)₀₂·₀₅O₁₂. The end-member formula for arseniopleite corresponds to CaNaMn₃²⁺Mn⁴⁺As₂O₃ whereas that of caryinite is Ca₂NaCaMn₃²⁺As₂O₃. J.L.J.
ASTROPHYLLITE GROUP


The compositions of 135 samples of astrophyllite-group minerals from 15 localities, and single-crystal X-ray structure refinements of 20 crystals from various localities, indicate a general formula \( A_2^{\text{X}}B_2^{\text{X}}C_2^{\text{X}}D_2^{\text{X}}E_2^{\text{X}}F_2^{\text{X}}(\text{OH})_{2m-n} \), where \( A = K, Rb, Cs, H, O, Na, \) or \( \square; D = Na \) or \( Ca; E = Mn, Fe^{\text{II}}, Fe^{\text{III}}; Na, Mg, \) or \( Zn; D = Ti, Nb, \) or \( Zr; T = Si \) or \( Al; X = F, OH, O \) or \( \square \).

The single-crystal X-ray refinements gave triclinic unit cells, space group \( \text{P}1 \), for astrophyllite, kupletskite, and niobokupletskite, but one specimen of a monoclinic cell, space group \( \text{C}2/c \), gave the formula \( K_2Na(Mn,Fe^{\text{II}})_7(Ti,Nb)_{2}Si_{8}O_{26}(OH)_4F \), from Lepke-Nelm, Lovozero massif, Russia, that plots well into the field for this mineral.

**TABLE 1.** Formulas for astrophyllite-group minerals

<table>
<thead>
<tr>
<th>Astrophyllite subgroup</th>
<th>Formula</th>
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</thead>
<tbody>
<tr>
<td>astrophyllite</td>
<td>( K_2Na(Fe^{\text{II}})_7Mn,TiSi_2O_8(OH)_4F )</td>
</tr>
<tr>
<td>magnesium astrophyllite</td>
<td>( K_2Na[Na(Fe, Mn), Mg]_2(Ti, Si)_2Si_2O_8(OH)_4 )</td>
</tr>
<tr>
<td>zircophyllite</td>
<td>( K_2Na(Fe^{\text{III}}, Mn)_{7}(Nb, Ti)_2Si_2O_8(OH)_4(F) )</td>
</tr>
<tr>
<td>zircophyllite analog</td>
<td>( K_2Na[Na(Fe, Mn)]_7(Zr, Nb)_2Si_2O_8(OH)_4 )</td>
</tr>
</tbody>
</table>

**Kupletskite subgroup**

<table>
<thead>
<tr>
<th>Kupletskite</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>kupletskite</td>
<td>( K_2Na(Fe^{\text{II}})_7Mn, TiSi_2O_8(OH)_4F )</td>
</tr>
<tr>
<td>niobokupletskite</td>
<td>( K_2Na(Fe^{\text{II}})_7(Mn, Nb)_2Si_2O_8(OH)_4F )</td>
</tr>
<tr>
<td>cesium kupletskite</td>
<td>( Ca_2K_2Na(Mn, Fe, Li)_7(Ti, Nb)_2Si_2O_8(OH)_4F )</td>
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</tbody>
</table>

* Unnamed, but one of the compositions plots well into the field for this mineral.

BERGENITE


**TABLE 2.** Formulas for astrophyllite-group minerals

<table>
<thead>
<tr>
<th>Bergenite</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bergenite</td>
<td>( Ca_2Ba_4[(UO_2)(PO_4)_2]_3(H_2O)_16 )</td>
</tr>
</tbody>
</table>

**EUDIALYTE GROUP**


**SIMMONSITE**


**TORBERNITE, ZEUNERITE, METATORBERNITE, METAZEUNERITE**


**URANOSPHAERITE**

**YUKSPORITE**


Electron diffraction patterns of yuksporite showed the mineral to be triclinic, \(P_1\), rather than orthorhombic (Am. Mineral., 71, 1547–1548, 1986); \(a = 16.50(5)\), \(b = 25.21(4)\), \(c = 21.11(3)\) Å, \(\alpha = 100.4(3)\), \(\beta = 110.0(4)\), \(\gamma = 90.4(1)\)°, \(Z = 2\). The strongest lines of the powder pattern (Murum massif) are 6.219(55,04–1), 3.104(90,080,44 –4–), 2.999(90,373 –,37–1), 2.915(70,371–,33–6–), and 2.796(100,375–). The published chemical data are reinterpreted as corresponding to \((K,Na)_{12}(Ca,Na,Sr,Ba)_{40}[Ti,Fe]_{12}(OH)_{18}Si_{48}O_{144}(OH,F,Cl)_{16}\)

**ZIPPEITE GROUP**


Single-crystal X-ray structure study \((R_1 = 0.0330)\) of synthetic zippeite gave monoclinic symmetry, space group \(C2\), \(a = 8.7524(4), b = 13.9197(7), c = 17.6972(8)\) Å, \(\beta = 104.178(1)\)°, \(Z = 4\); the results, and a re-interpretation of previous structure data (Am. Mineral., 81, p. 770, 1996), yield a formula revised to \(K_3(H_2O)_3(UO_2)_4(SO_4)_2O_3(OH)\). Synthetic sodium-zippeite \((R_1 = 0.0688)\) is monoclinic, \(P2_1/n\), \(a = 17.6425(11), b = 14.6272(9), c = 17.6922(11)\) Å, \(\beta = 104.461(1)\)°, \(Z = 4\), and corresponds to \(Na_5(H_2O)_{12}(UO_2)_8(SO_4)_4O_5(OH)_3\). Synthetic magnesium-zippeite \((R_1 = 0.0239)\), zinc-zippeite \((R_1 = 0.0457)\) and cobalt-zippeite \((R_1 = 0.0555)\) are monoclinic, space group \(C2/m\), approximate \(a = 8.65, b = 14.2, c = 17.7\) Å, \(\beta = 104.1\)°, \(Z = 8\), and correspond to \(M(H_2O)_{3.5}(UO_2)_2(SO_4)O_2\) in which \(M\) is Mg, Co, and Zn, respectively.

**ERRATA**

In the abstracts for calcioburbankite and lovozerite (Am. Mineral., 88, p. 934), the page numbers given as 1009–1013 for calcioburbankite and 1019–1029 for lovozerite incorrectly refer to the original Russian publication (Kristallografiya) and should be changed to read 929–937 and 937–941, respectively, for the journal cited in the abstracts. We thank J. Ferraiolo for pointing out the error.