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

CVOITE*


The mineral occurs as radial aggregates consisting of acicular to elongate prismatic crystals up to 0.28 mm long and 2 mm wide. Colorless, transparent, vitreous luster, brittle, H not determinable, no cleavage or parting, Dcalc = 4.21 g/cm3 for the empirical formula and Z = 4. High R.I., perhaps ~2. Electron diffraction patterns are consistent with the structure for the synthetic analog, which is orthorhombic, space group, Pnam; a = 10.42(2), b = 5.28(2), c = 10.34(2) Å as refined from an X-ray powder pattern (57 mm Gandolfi, CrKα radiation) with strongest lines of 5.16(M,200), 3.45(W,211,112), 3.00(S,212), 2.88(W,013,203), 1.85(M,024), and 1.56(W,612,033,216).

The mineral occurs in microcavities of massive layers of carpyolite and rhodochrosite within brannerite layers at the Gambatesa mine, near Reppia, Liguria, northern Italy. The new mineral name alludes to the chemical composition. Type material is at the Università de Genova, Italy. J.L.J.

FERRIALLANITE-(Ce)*

P.M. Kartashov, G. Ferraris, G. Ivaldi, E. Sokolova, C.A. McCammon (2002) Ferriallanite-(Ce), CaCeFe2+Al2(SiO4)(Si2O7)O(OH). Type material is in the Fersman Mineralogical Museum, Moscow, Russia. The authors also give a microprobe analysis for an analog corresponding to CaCeFe3+Fe2+3(SiO4)(Si2O7)O(OH). J.L.J.

KEILITE*


KEILITE*


One of six listed electron microprobe analyses has Fe 39.57, Mg 10.36, Mn 3.43, Ca 1.86, Cr 1.98, Zn 0.30, Ti 0.09, Cu 0.01, S 41.46, sum 99.06 wt%, corresponding to (Fe0.55,Mg0.40,Mn0.05)(Ca0.70,Fe0.30,Al0.20,S1.00,0.01,0.00)S4. The mineral occurs as opaque grains up to several hundred micrometers across. Dcalc = 3.59–3.67 g/cm3 for Z = 4. Optically isotropic, with reflectance percentages (SiC standard) 26.0–27.2 in air, and 11.7–12.2 in oil for the above composition; reflectance increases with increasing Fe content. The reported X-ray powder-diffraction pattern has two lines: 2.584(200) and 1.829(221), indexed by analogy with niningerite, yielding a = 5.17 Å. Solid solution between niningerite (Mg,Fe)S and keilite (Fe,Mg)S, and the existence of the Fe-dominant species now categorized as keilite have been known for many years, but the Fe-dominant species now remains to be named. The mineral occurs in several enstatite meteorites, and makes up 11 vol% of the Abee (Abee, Alberta, Canada) enstatite chondrite, which is designated the type material and is housed in the Hawaiian Institute of Geophysics and Planetology at Honolulu. The new mineral name is for meteoricist Klaus Keil (b. 1934) of that institution. J.L.J.

MAGNESIOSTAUROLITE*, ZINCOSTAUROLITE*


* 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

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**Magnesiostaurolite**

Electron and ion microprobe analyses gave SiO$_2$ 30.66, Al$_2$O$_3$ 57.45, TiO$_2$ 0.18, FeO 0.72, MgO 7.77, ZnO 0.10, Li$_2$O 0.90, H$_2$O (calc.) 2.30, sum 100.08 wt%, corresponding to (\(\sqrt[3]{1.12}\)Mg$_{0.67}$Fe$_{0.33}$)$_2$Zn$_{0.01}$O$_{4.02}$Si$_{8}$O$_{20}$(OH)$_2$2H$_2$O (\(\sqrt[3]{1.97}\)Al$_{0.11}$Fe$_{0.10}$)$_2$Zn$_{0.02}$O$_{4.02}$Si$_{8}$O$_{20}$(OH)$_2$2H$_2$O. The mineral occurs as anhedral inclusions, to 250 µm, in pyrope megaklasts. Colorless and transparent in thin section, vitreous to resinous luster, white streak. \(\text{H} = 7–7\frac{1}{2}\), \(\text{D}_{\text{m}} = 3.54 \text{g/cm}^3\), not twinned. Colorless with a prismatic habit in thin section, biaxial positive, \(\alpha = 1.785(5), \beta = 1.814(5), \gamma = 1.854(5)\). \(\text{V}_{\text{m}} = 85, \text{V}_{\text{calc}} = 82.4\%\). Weak dispersion \(r < v\), pleochroism not stated. Single-crystal X-ray crystal structure study indicated monoclinic symmetry, space group \(\text{C}2/m\), \(a = 7.8706(5)\), \(b = 16.5411(16)\), \(c = 5.6233(3)\ \text{Å}, \beta = 90.007(4)\)°. Strongest lines of the calculated X-ray powder pattern are \(3.001(61,221), 2.678(71,132), 2.370(33,330), 1.968(100,062), \) and \(1.391(82,462)\). Colorless in thin section, with physical properties similar to those of magnesiostaurolite. Optically biaxial positive, \(\alpha = 1.722(2), \gamma = 1.734(2), Z = c\), nonpleochroic. Single-crystal X-ray crystal structure study (\(R = 0.025\)) indicated monoclinic symmetry, space group \(\text{C}2/m\), \(a = 7.853(6), b = 16.534(9), c = 5.639(5)\ \text{Å}, \beta = 90.00(8)\)°. Strongest lines of the calculated X-ray powder pattern are \(3.001(61,221), 2.678(71,151), 2.390(87,132), 1.968(61,062), \) and \(1.391(100,462)\). The mineral is associated with kyanite, muscovite, margarite, chloritoid, gahnite, and 1.391(100,462). The mineral occurs with talc, clinochlore, and 1.391(82,462). The mineral occurs as anhedral inclusions, to 250 µm, in pyrope megaklasts. Colorless and transparent in thin section, vitreous to resinous luster, white streak. \(\text{H} = 7–7\frac{1}{2}\), \(\text{D}_{\text{m}} = 3.54 \text{g/cm}^3\), not twinned. Optically biaxial positive, \(\alpha = 1.785(5), \beta = 1.814(5), \gamma = 1.854(5)\). \(\text{V}_{\text{m}} = 85, \text{V}_{\text{calc}} = 82.4\%\). Weak dispersion \(r < v\), pleochroism not stated. Single-crystal X-ray crystal structure study (\(R = 0.025\)) indicated monoclinic symmetry, space group \(\text{C}2/m\), \(a = 7.853(6), b = 6.2314(7), c = 7.3889(9)\ \text{Å}, \beta = 116.392(2)\)°, isotypic with the tsumcorite structure. The strongest lines of the X-ray powder pattern (114 mm Gandolfi, FeKα radiation) are \(4.93(80,110), 3.182(100,112), 2.927(70,201), 2.822(70,021), 2.718(80,311), 2.555(100,221,312), \) and \(2.134(70,202,221)\). The mineral is associated with calcite, talc, and saulafite (IMA mineral 2000–005) in hydrothermal discordant veinlets within massive braunite ore at the Starlera manganese deposit, Val Ferrera, eastern Swiss Alps. The new mineral name alludes to the Mn$^{4+}$ dominance within the lotharmeyerite subgroup of the tsumcorite group. Type material is in the Musée géologique cantonal, Lausanne, Switzerland.

**Lotharmeyerite**

The cation composition of the Me2 site is the main guide for the naming of the lotharmeyerite subgroup, wherein Me = Ca and X = As. Lotharmeyerite was originally described as CaZnMn$^{4+}$\{As$_{0.00}$\}$_2$OH·2H$_2$O and was subsequently revised to Ca(Mn$^{4+}$\{As$_{0.00}$\}$_2$OH·2H$_2$O)$_2$ (OH, H$_2$O)$_2$, which takes into account the substitution of [As$_2$(OH)$_2$] for [As$_2$O$_6$]. The mineral is brown-red to dark reddish orange, adamantine luster, transparent to translucent, brittle, irregular fracture, light brown streak, distinct \(\{01\}\) cleavage, \(\text{H} = 3, \text{D}_{\text{m}} = 3.77(2), \text{D}_{\text{cal}} = 3.75(2)\ \text{g/cm}^3\) for the empirical formula and \(Z = 2\). Optically biaxial positive, \(\alpha = 1.785(2), \beta = 1.814(5), \gamma = 1.854(5)\). \(\text{V}_{\text{m}} = 85, \text{V}_{\text{calc}} = 82.4\%\). Weak dispersion \(r < v\), pleochroism not stated. Single-crystal X-ray crystal structure study (\(R = 0.025\)) indicated monoclinic symmetry, space group \(\text{C}2/m\), \(a = 9.043(1), b = 6.2314(7), c = 7.3889(9)\ \text{Å}, \beta = 116.392(2)\)°, isotypic with the tsumcorite structure. The strongest lines of the X-ray powder pattern (114 mm Gandolfi, FeKα radiation) are \(4.93(80,110), 3.182(100,112), 2.927(70,201), 2.822(70,021), 2.718(80,311), 2.555(100,221,312), \) and \(2.134(70,202,221)\). The mineral is associated with calcite, talc, and saulafite (IMA mineral 2000–005) in hydrothermal discordant veinlets within massive braunite ore at the Starlera manganese deposit, Val Ferrera, eastern Swiss Alps. The new mineral name alludes to the Mn$^{4+}$ dominance within the lotharmeyerite subgroup of the tsumcorite group. Type material is in the Musée géologique cantonal, Lausanne, Switzerland.

**Hexagonal Pentlandite**


The mineral occurs as an inclusion, 60 × 75 µm, in an octahedron of diamond that also contains inclusions of sylvite and a Ca chloride. The morphology of the sulfide mineral is stout tabular, showing \{001\} and a hexagonal dipyramid \{h0l\}. One of seven similar listed electron microprobe analyses has Fe $31.06$, Ni $34.18$, Co $0.44$, $\text{S} = 33.17$, sum $98.85$ wt%, corresponding to (Ni$_{2.99}$Fe$_{0.99}$)$_2$\{Co$_{0.99}$\}$_2$\{S$_{1.99}$\}. The Raman spectrum (illustrated) differs substantially from that of pentlandite. The diamond is from Liaoning Province, northeastern China. J.L.J.
CUBIC AgBiS₂


The mineral occurs in quartz as gray-black anhedral grains, to about 0.3 mm, that contain only Ag, Bi, and S, with Ag:Bi = 1.02:1. The X-ray powder pattern (57 mm camera, FeKα radiation) has shown six listed indices, on a cubic cell with a = 5.703 Å: 3.290(80,111), 2.853(100,200), 2.014(80,220), 1.721(50,311), 1.640(20,222), and 1.276(10,420). The mineral is considered to be distinct from maldite, which is hexagonal. J.L.J.

K,Na Sulfides


For one of seven electron microprobe analyses listed, and the range for the seven, results are K 0.69 (0.61–0.77), Na 0.13 (n.d.–0.13), Cu 44.82 (44.82–47.70), Fe 19.39 (17.42–19.39), As n.d. (n.d.–0.09), S 33.65 (32.14–33.65), sum 98.74 (96.99–98.74) wt%., possibly corresponding to Cu₉₋₄NaK₆₋₄(S₂O₃) (Fe₇₋₉Cu₂₇₋₉) (SiC₁₀₋₉As₁₋₉O₂₋₉)·(NaOH)₀.₃₋₀.₉ (KOH)₀.₀₂ and possibly with H₂O to account for low totals.

An associated Na-bearing sulfide is also lilac-gray to yellow in reflected light, but lacks bireflectance and anisotropy. Perfect lamellar cleavage, birefringence, VHN₅ = 57, D analyzer = 3.36(2) g/cm³, representative reflectance percentages for R₁ and R₂ in air are 55(460), 52(440), 50(540), 48(580), and 35(660). One of seven listed electron microprobe analyses, and the range for the seven, has Na 1.64 (1.37–3.91), K 0.32 (0.27–0.38), Cu 34.02 (29.76–37.26), Fe 17.22 (16.93–18.10), As 0.26 (0.03–0.38), S 28.01 (23.52–30.32), sum 81.70 (75.27–88.69) wt%, possibly corresponding to Cu₂Fe₅₁₋₂₈Pb₁₆Bi₁₂S₂₁ (NaOH)₀.₃₋₀.₉ (KOH)₀.₀₂ and possibly with H₂O to account for low totals.

Both minerals occur in a hyperagpaitic pegmatite, specifically its “salt” core containing viilliaumite, natrite, thermatournite, and natrophosphate, that is exposed in a quarry at Koshva Mountain, Khibiny massif, Russia. The sulfides occur as yellowish and brownish bronze poorly tabular grains, up to 3 mm across, that split easily into fine flakes along the lamination.

Discussion. See also Am. Mineral., 88, p. 934 (2003), which summarizes results for other alkali-bearing Cu-Fe sulfides from the same locality. J.L.J.

Cu₂FePB₈Bi₃S₂₁


The mineral occurs as grains, to 0.1 mm, intergrown with mica in a complex metamorphic assemblage that includes boulangerite, meneghinite, and kobellite. White in reflected light, similar to galena but strongly anisotropic. One of two listed and similar microprobe analyses has Cu 10.58, Ag 0.01, Fe 10.87, Pb 40.84, Sn 0.07, Sb 0.48, Bi 12.61, As 0.05, S 21.92, Se 0.44, Te 0.04, sum 97.91 wt%, corresponding to Cuₓ₁₋₄Fe₃₋₄Pb₈₋₉Bi₁₂₋₉S₉₋₄D₀.₀₂₋₁₋₄O₁₆₋₁₋₄, simplified as CuₓFe₉Pb₈Bi₃S₂₁. J.L.J.

(Cr,V)₂Ti₂O₇, (Cr,V)₂Ti₂O₁₁


One of three listed, and another of five listed, electron microprobe analyses have, respectively, TiO₂ 52.15, 68.92, Cr₂O₃ 16.40, 8.47, V₂O₅ 29.32, 21.79, FeO 0.52, 0.14, Al₂O₃ 0.68, 0.43, sum 99.07, 99.75 wt%, corresponding to (V₁₋₂Cr₀.₆₇Al₁₋₂O₃)₀.₇₆Ti₂₋₉O₁₁ and (V₁₋₂Cr₀.₆₇Al₁₋₂O₃)₀.₇₆Ti₂₋₉O₁₁, simplified as (V,Cr)₂Ti₂O₇ and (V,Cr)₂Ti₂O₁₁. Both have considered Cr-for-V substitution, and the sesquioxide has both Cr > V and V > Cr. The minerals occur as inclusions, up to 10 µm, associated with berdesinskiite, schreyerite, and olkhonskite in rutile in high-grade metamorphic carbonate and quartzitic rocks at Lake Baikal, Russia. J.L.J.

Fe-Dominant Reevesite


The mineral occurs as aggregates, up to 300 µm across, and as thin veinlets in strongly weathered serpentinite. One of nine listed electron microprobe analyses, for which formula Fe²⁺ is predominant and Ni + Mg ranges from 1.97 to 0.24, has MgO 0.08, total Fe as FeO 55.29, NiO 18.88, Al₂O₃ 0.28, Cr₂O₃ 0.12, SiO₂ 1.18, H₂O + CO₂ (by difference) 24.17, C detectable, sum 100 wt%, corresponding to (Fe₅₋₄Ni₁₋₂₄₄Al₀.₀₁₄₀₃)₀.₃₋₀.₄ₐ₄₁₆₋₁₋₄O₂₋₁₋₄(OH)₀.₀₂₋₁₋₄H₂O; the cation composition lowest in Ni corresponds to (Fe₅₋₄Ni₁₋₂₄₄Al₀.₀₁₄₀₃)₀.₃₋₀.₄ₐ₄₁₆₋₁₋₄O₂₋₁₋₄(OH)₀.₀₂₋₁₋₄H₂O. X-ray diffraction of bulk ore samples showed the presence of talc and magnesite, plus non-overlapped peaks at 7.60 and 3.80 Å that correspond to data for reevesite. J.L.J.

Montmorillonite, Fe-Dominant

The sample is a greenish clay in strongly altered peridotite nodules within fresh Pleistocene basalt at Öbberg, near Hundsangen, Rhineland-Palatinate, Germany. Chemical analysis of the <0.2 μm fraction gave Na₂O 2.80, K₂O 0.10, CaO 0.08, MgO 6.15, FeO 0.92, NiO 0.32, Al₂O₃ 4.81, Fe₂O₃ 17.0, TiO₂ 0.18, SiO₂ 50.8, sum 83.85 wt%, corresponding to (Na0.42K0.01)(Fe³⁺0.98Mg0.07Al0.37Fe²⁺0.16Cr³⁺0.01Ni²⁺0.02)Σ2.12O₆(OH)₂. The X-ray diffractogram corresponds to that of smectite, and the IR spectrum is similar to that of smectite. Analytical electron microscopy of individual particles showed that two compositional populations are present (45 structural formulas are tabulated), one corresponding to M⁺Σ0.19(Fe³⁺1.16Mg0.86Al0.24Σ2.21(Si1.99Al0.01), and the other to M⁺Σ0.28(Fe³⁺1.16Mg0.74Al0.34Σ2.18(Si0.96Al0.10). The particles with little tetrahedral Al (the first population) form a minor part of the sample, have Fe³⁺ as the dominant octahedral cation, and are concluded to be a good representation of the Fe³⁺-dominant analog of montmorillonite. J.L.J.

FE-DOMINANT SEPIOLITE


The mineral occurs as flattened aggregates (2–3 mm) of cream-colored fibres at Flora Mountain in the contact aureole of the Lovozero alkaline massif, Kola Peninsula, Russia. Electron microprobe analysis (percentages not given) corresponds to Ca0.02(Fe2.23Mn0.06Mg0.45Zn0.57Ti0.08)Σ2.00(Al2.68Si2.32O15.00[(OH)]1.15O0.26H2.00·nH2O. Optically biaxial positive, α = 1.557, β = 1.560, γ = 1.597, pleochroism X = pale brown, Z = light brown, Z > X. Indexing of the X-ray powder pattern (diffractometer, CuKα radiation, nine lines listed) gave a = 13.53, b = 26.70, c = 5.130 Å; strongest lines are 12.19 (100,110), 3.72(30,260,051), 3.33(90,080,311), and 2.53 (80,371,470). Studies of several other specimens showed that a Mg–Fe series is present, and that the optical properties and IR spectrum change systematically with composition. The mineral occurs as a late-stage, low-temperature hydrothermal product in small cavities and interstices in an aegirine-narsarsukite-quartz assemblage with associated yofortierite, opal, and apatite.

Discussion. The same mineral has been reported from elsewhere, but with a less detailed description (Am. Mineral., 73, p. 445, 1988). J.L.J.

NEW DATA

AJOITE


Single-crystal synchrotron X-ray structure study of a 60 × 15 × 5 μm grain of ajoite from the type locality gave a triclinic unit cell with a = 13.634(5), b = 13.687(7), c = 14.522(7) Å, α = 110.83(1), β = 107.21(1), γ = 105.68(1)°, R = 0.125. The space group was identified as P̅I and the formula (Am. Mineral., 66, 201–203, 1981) was slightly revised to that given in the title. Diffraction spots are streaked. The structure has Si-Al and Na-K disorder, and the predominance of the specific A⁺ cation is uncertain. J.L.J.

TRIPUHYITE


Electron microprobe analyses of a type specimen of tripuhyite, from Tripuhy, Minas Gerais, Brazil, and of tripuhyite from Falotta, Grisons, Switzerland, gave Sb₂O₅ 69.3, 62.3, FeO 30.0, 34.3, sum 99.3, 99.6 wt%, respectively, corresponding to Fe₀.93Sb₁.06O₄ and Fe₁.05Sb₀.94O₄, ideally Fe⁺²Sb³⁺O₄ rather than FeSbO₄. Single-crystal X-ray structure study of the type material (R = 0.0361) gave a = 4.625(4), c = 3.059(5) Å, tetragonal, space group P4⁺/mmm, Z = 1, rutile structure type with Fe and Sb disordered over the cationic sites. The new formula and the structure type redefining tripuhyite were approved by the CNMMN. J.L.J.

DISCREDITED MINERAL

Squawcreekite


Squawcreekite was described in 1991 as a new mineral with the composition (Fe⁺²₀.₃₀Sr⁺²₀.₅₀Sn⁺²₀.₀₅T₁₀.₇₁Al₀.₀₁)Σ₲₀.₀₅O₄. The redefinition of tripuhyite (in preceding abstracts) as FeSbO₄ and the identical properties of tripuhyite and squawcreekite indicate that the two minerals are one species. The historical priority belongs to tripuhyite, which was named in 1891, and the CNMMN has therefore approved the discreditation of squawcreekite. J.L.J.