New Mineral Names*

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AURIVILLIUSITE*


Electron microprobe analysis gave Hgo 40.10, HgO 38.62, I 22.76, Br 0.22, Cl 0.06, O = 1,Br/Cl 1.46, sum 100.30 wt%, corresponding to Hg\(^{2+}\)I\(^{–}\)Hg\(^{2+}\)O\(_2\)I\(_{0.01}\)Br\(_{0.01}\)Cl\(_{0.01}\). For O + I + Br + Cl = 2 and with Hg\(^{2+}\) and Hg\(^{2+}\) partitioned in accordance with the synthetic analog. The mineral occurs as irregular, patchy coatings, each up to 0.5 mm, and with individual grains up to 200 µm in length, showing {100}. Dark gray-black color, metallic luster, opaque, brittle, dark red-brown streak, uneven fracture, {100} cleavage, nonfluorescent, H uncertain (<5), D\(_{\text{calc}}\) = 8.96 g/cm\(^3\) for the empirical formula and Z = 8. Similar to cinnabar in reflected light, extremely light-sensitive, twinned, average n = 2.35–2.38, no internal reflection but red highlights gradually appear and coalesce. Single-crystal X-ray study indicated monoclinic symmetry, space group C2\(\overline{1}\) (synthetic analog); a = 17.580(6), b = 6.979(1), c = 6.693(3) Å, \(\beta = 101.71(4)\)\(^\circ\) as refined from a Debye–Scherrer powder pattern (114 mm, CuK\(_\alpha\) radiation) with strongest lines of 8.547(70,200), 3.275(100,020), 2.993(80,221), and 2.873(80,600).

The mineral, which is chemically the I-dominant analog of terlinguane but is not isomorphic with it, is associated with an undefined Hgo mineral, native mercury, cinnabar, and edgarbaileyite that occur on a quartz veinlet in magnesite-bearing serpentine from a prospect pit near the former Clear Creek mercury mine, San Benito County, California. The new mineral name is for Karin Aurivillius (1920–1982) of the University of Lund, Sweden, who synthesized and determined the crystal structures of many Hg compounds. Type material is in the Systematic Reference Series housed at the Geological Survey of Canada, Ottawa. J.L.L.J.


The mineral forms colorless prismatic crystals, each to 0.3 mm and showing {001} and {100}, that are commonly intergrown. Electron microprobe analysis gave Na\(_2\)O 0.63, K\(_2\)O 12.85, FeO 0.28, CuO 0.83, ZnO 3.85, Al\(_2\)O\(_3\) 27.33, SiO\(_2\) 12.35, As\(_2\)O\(_3\) 40.60, P\(_2\)O\(_5\) 1.63, sum 100.35 wt%, corresponding to (K\(_2\)Na\(_{0.07}\))\(_{22.76}\)Fe\(_{0.28}\)Cu\(_{0.83}\)Zn\(_{3.85}\)Al\(_{2}\)Si\(_{2}\)O\(_{2}\)P\(_{1.00}\)O\(_{2}\) simplified as K\([(Al,Zn)\_2(As, Si)\_2]\)=. Vitreous luster, transparent, brittle, white streak, H = 5–6, good {100} cleavage, D\(_{\text{calc}}\) = 2.92 g/cm\(^3\) for Z = 8, nonfluorescent. Optically biaxial negative, α = 1.531(2), β = 1.535(1), γ = 1.537(1), 2\(\nu\)\(_{\text{calc}}\) = 60(10)\(^\circ\), orientation Y normal to {001}, Z normal to {100}. Single-crystal X-ray study (R\(_{\text{f}}\) = 0.033) indicated monoclinic symmetry, space group \(P2_1/c\), a = 8.772(1), b = 13.370(2), c = 14.690(2) Å, \(\beta = 115.944(6)\)\(^\circ\), isosstructural with celsian. Strongest lines of the powder pattern (114 mm Debye–Scherrer, CuK\(_\alpha\) radiation) are 4.329(70,202), 3.897(70,130), 3.364(100,220,204,040), 3.300(50,004,040), and 2.981(60,042).

The mineral is associated with alunokluchevskite, lammerite, johillerite, sylweite, hematite, tenorite, and especially As-bearing orthoclase, which formed as products of fumarolic activity on the second cinder core of the North Breach of the Great Fissure Tolbachik eruption, Kamchatka Peninsula, Russia; fumarole gases at the time of mineral collection were at 410–420 °C. The new mineral name is for Stanislav K. Filatov (b. 1940) of Saint Petersburg State University, who has contributed extensively to studies of exhalation minerals. Type material is in the museum of the Department of Mineralogy, Saint Petersburg State University, Saint Petersburg, Russia. J.L.L.J.


The mineral is the more abundant phase in a single anhedral particle ~35 µm in diameter. An average of five electron microprobe analyses gave Fe 75.3, Si 18.4, Co 0.12, Ni 3.14, P 1.85,
Cr 0.37, sum 99.2 wt%, corresponding to (Fe$_{1.22}$Ni$_{0.05}$Cr$_{0.01}$)$_{2.27}$3 (Si$_{0.02}$P$_{0.00}$)$_{0.68}$ for 2 atoms, ideally 2/3Fe$_3$Si. Yellowish white in reflected light, isotropic. Reflectance values (method and standard not given) are 47.1 (470 nm), 48.8 (546), 50.0 (589), and 50.9 (650). $D_{\text{calc}} = 6.83 \text{ g/cm}^3$ for the empirical formula and $Z = 1$. Single-crystal X-ray diffraction study using an in-situ synchrotron technique gave cubic symmetry, space group $Pm\bar{3}m$, $a = 2.831(4)$ Å. The observed diffraction lines and intensities (could not be measured) are 2.831(100), 2.000(110), 1.631(111), 1.415(200), 1.267(210), 1.157(211), and 1.000(220).

The mineral occurs in a regolith-breccia clast in the lunar meteorite Dhofar 280 from Oman. The matrix is mainly vitriified plagioclase ("maskelynite"). The less abundant mineral in the ~35 μm-diameter particle is FeSi; the particle also has areas enriched in P and Ti. Other minerals in the clast are Fe-Ni metal and FeSi$_2$. The new mineral is interpreted to have formed by impact-induced, vapor-phase deposition in lunar soil. The new name is for Bruce Hapke (emeritus, University of Pittsburgh), who first predicted the presence of vapor-deposited elemental Fe as coatings on lunar soil grains.

**Discussion.** The optical properties and reflectance values are from the listing of new minerals approved in 2003 (IMA No. 2003–014, Can. Mineral., 42, p. 907); density was calculated from the given composition and cell volume. The mineral closely resembles the high-temperature phase Fe$_2$Si$_2$(h) synthesized by Khalaff and Schubert (1974, J. Less-Common Metals, 35, 341–345); its structure is of the CsCl type. Analyses are also given for FeSi and FeSi$_2$; minerals still of questionable status insofar as they have not had an explicit CNMMN approval (e.g., Am. Mineral., 54, p. 1737; 79, p. 188). E.S.G.

**HERBERTSMITHITE**


The mineral forms coatings of dark-green, complex rhombohedra, mostly 0.5–1 mm in diameter, or larger flattened crystals and aggregates at the type locality. Electron microprobe analysis of the type specimen gave CuO 56.1, ZnO 18.2, Cl 17.2, H$_2$O 12.5 (TGA loss from between 300 and 340 °C), O = Cl 3.9, sum 100.1 wt%, corresponding to Cu$_{16}$Zn$_{99}$OH$_{51}$H$_{10}$Cl$_{258}$ for Cu + Zn + Cl = H = 12, ideally Cu$_2$Zn(OH)$_3$Cl$_2$. Translucent, color green to blue-green, luster vitreous, $H = 3–3/2$, good {1011} cleavage, $D_{\text{meas}} = 3.75–3.95$, $D_{\text{calc}} = 3.75 \text{ g/cm}^3$ for $Z = 3$. Optically uniaxial negative, $\varepsilon = 1.817(2)$, $\omega = 1.825(2)$. Dichroism is green to greenish blue, weak, with $O > E$. The infrared spectrum includes features at 3410, 3380, 3320, 970, 945, 753, 597, and 460 cm$^{-1}$. Single-crystal X-ray structural study ($R = 0.011$) showed the mineral to have trigonal symmetry, space group $R\bar{3}m$, $a = 6.834(1)$, $c = 14.075(2)$ Å. The strongest lines of the powder pattern (37 lines listed; diffractometer, CuKα radiation) are 5.466(55,101), 4.702(14,003), 2.899(11,201), 2.764(100,113), 2.730(13,202), 2.266(36,204), 1.820(13,303), and 1.709(18,220).

The mineral occurs on a white quartzite at Mina Los Tres Presidentes, Sierra Gorda, Chile (type locality), in association with gypsum, opal pseudomorphs after a radiating acicular mineral and diopside. Other occurrences are at the Kali Kafi and Chah Khouni mines, Anarak, Iran ("anarakite") in "limonite" gossan and metamorphosed dolomitic limestone, respectively. Associated minerals include wulfenite, hemimorphite, chrysocolla, rosasite, iranite, and diaboléite. The new name is for G.F. Herbert Smith (1872–1953), late of the British Museum (Natural History), who discovered paratacamite. Type material is in the Natural History Museum, London, UK.

**Discussion.** The formula and density were calculated from the data in the paper. Paratacamite, which forms a solid solution with herbertsmithite, is defined as Cu$_6$(Cu,M$^{+}$)(OH)$_3$Cl$_2$, with M$^{+}$ = –0.33–0.5, space group $R\bar{3}$, $Z = 24$, with pronounced $R\bar{3}m$ substructure. E.S.G.

**JACQUESDIETRICHITE**


The mineral occurs as bright blue blades, intergrowth tablets, and scales, with the blades up to 0.5 mm long and 0.02 mm in thickness; {001} is dominant and is bounded by {100} and {010}. Vitreous luster, pale blue streak, irregular fracture, blades slightly flexible, $H = 2$, perfect {100} and good {010} and {001} cleavages, nonfluorescent, rapidly soluble in dilute HCl, $D_{\text{meas}} = 3.28(5)$, $D_{\text{calc}} = 3.303 \text{ g/cm}^3$ for $Z = 4$. Optically biaxial negative, $\alpha = 1.627(2)$, $\beta = 1.699(2)$, $\gamma = 1.769(2)$, $2V_{\text{calc}} = 86^\circ$, no dispersion, orientation $X = a$, $Y = c$, $Z = b$; pronounced pleochroism, $X =$ deep blue, $Y =$ medium blue, $Z =$ pale blue. Electron microprobe analysis gave CuO 72.68, CaO 0.11, SiO$_2$ 1.00 wt%, but the mineral is unstable and no empirical formula was calculated. Single-crystal X-ray structure study ($R = 0.0657$) showed the mineral to be identical to synthetic Cu$_6$(BO$_3$)(OH)$_3$; orthorhombic, space group $Pmna$, $a = 9.455(2)$, $b = 5.866(2)$, $c = 8.668(2)$ Å. Strongest lines of a Gandolfi powder pattern (114 mm, CuKα radiation) are 4.734(100,200), 3.941(100,200), 2.545(302), 2.489(50,220), and 1.922(50,322).

The mineral, which is thought to be of hydrothermal origin, is associated with herriermite, gaufrecteoyite, and calcite in the Tachgagalt vein Mn deposit near Ouarzazate, Morocco, at which the occurrences are in small cavities in gaudefroyite–calcite rock and as inclusions in calcite. The new mineral name is for French geologist Jacques Emile Dietrich (b. 1926), who collected the specimens. Type material is in the Natural History Museum of Los Angeles County, California. J.L.J.

**LARISAITE**


The mineral occurs as canary-yellow lamellar crystals, with {010} dominant and up to 1 mm long, and as radial aggregates up to 2 mm across. Most crystals are rough and corrugated. Electron microprobe analysis gave Na$_2$O 2.04, K$_2$O 0.69, CaO 0.23, UO$_3$...
MANGANOOKUSVUMITE*


The mineral forms fan-shaped to radial groups in which crystals are sword-shaped, flattened on {100}, elongate [010] to 0.5 mm, showing [100], [010], and a prism. Colorless, transparent, vitreous luster, white streak, splintery fracture, \( H = 5\frac{1}{2} – 6 \), no cleavage, sectile and slightly flexible, no twinning, nonfluorescent, \( D_{\text{meas}} = 2.86(1) \), \( D_{\text{calc}} = 2.88 \text{ g/cm}^3 \) for the empirical formula and \( Z = 2 \). The mineral is sectile, and grinding destroys the structure. Optically biaxial negative, \( \alpha = 1.597(2), \beta = 1.770(5), \gamma = 1.775(5), 2V_{\text{meas}} = 20^\circ \), strong dispersion \( r < v \). Orientation \( X = b, Z = b, Z = c \) parallel to the elongation; pleochroism \( Y, Z \) = light greenish yellow. Single-crystal X-ray structure study (\( R = 0.067 \)) indicated monoclinic symmetry, space group \( P11m \); \( a = 6.968(2), b = 7.670(5), c = 17.254(6) \AA, \gamma = 90.29(3)^\circ \) as refined from a Gandolfi powder pattern (114 mm, CuK\(\alpha \) radiation) with strongest lines of \( 8.63(43,002), 7.67(100,010), 3.85(40,113,020,113), 3.107(77,211), \) and 2.874(53,006,115).

The structure has similarities to that of guilleminite.

MONALBITE


The monoclinic Na-dominant analog of sanidine is known as a synthetic compound referred to as “monalbite.” The compound has been detected, on a submicrometer scale, coexisting with albite in jadeite quartzite in an ultra high-pressure terrane at Shuanghe, Dabie Mountains, China (long. \( 116^\circ 24' 16'' \text{E}, \) lat. \( 30^\circ 39' 02'' \text{N} \)). The average composition of the “monalbite” is stated to be about \( \text{Na}_{0.75}\text{Fe}_{0.55}\text{Al}_{2.5}\text{Si}_{12.6}\text{O}_{36} \), with the Fe a contaminant from the sample holder. SAED patterns gave \( a = 8.29(3), b = 12.97(3), c = 7.15(3) \AA, \beta = 116.2(1)^\circ \), systematic extinctions consistent with space group \( \text{C}2/m \); the results are in good agreement with data for the synthetic analog. J.L.J.

NESKEVAARAITE-FE*


The mineral occurs as brownish to yellowish brown prismatic crystals, up to 1.8 cm long and 1 mm thick, some showing longitudinally striated prisms \{010\}, with \{100\}, \{010\}, and less commonly \{010\} and \{021\}. Vitreous luster, translucent, brittle, white streak, \( H = 5 \), uneven fracture, no cleavage, microtwinned on \{001\} and \{010\}. Electron microprobe analysis gave \( a = 1.677(1), \beta = 1.684(2), \gamma = 1.790(5), 2V_{\text{meas}} = 25(10)^\circ \), almost nonpleochroic, orientation \( Y = b \). Electron microprobe analysis gave Na\(_2\)O 3.10, K\(_2\)O 88.3, Ba\(_2\)O 3.37, Mg\(_2\)O 0.75, MnO 0.50, FeO 1.82, SiO\(_2\) 39.29, TiO\(_2\) 15.08, Nb\(_2\)O\(_5\) 17.96, H\(_2\)O (TGA) 9.26, sum 99.96 wt\% which for \( [\text{Si}_{1.07}\text{O}_{3.93}](\text{O},\text{OH}) \) corresponds to \( \text{Na}_{1.22}\text{K}_{1.28}\text{Ba}_{0.09}\text{Fe}_{0.01}\text{Mg}_{0.05}\text{Ti}_{0.26}\text{Mn}_{0.00}\text{Nb}_{0.00}\text{Si}_{2.29}\text{O}_{7.17}\text{OH}_{0.24}\text{H}_{2}\text{O} \) simplified as Na\(_2\)K\(_2\)Fe(Nb\(_2\)Ti\(_{12}\))\(_2\)O\(_{17}\)•2H\(_2\)O.

Single-crystal X-ray structure study (\( \text{Am. Mineral.} \), 89, p. 1829, 2004) indicated monoclinic symmetry, space group \( \text{Cm}, a = 14.450 \) (6), \( b = 13.910(6), c = 7.836(4) \AA, \beta = 117.42(1)^\circ \), gutkovite structural type in the labuntsovite group. Strongest lines of the X-ray powder pattern (FeK\(\alpha \) radiation) are 6.93(100,020,001), 4.93(80,021), 3.21(100,400,421,402), 3.11(90,041,022), 2.62(60,151,241,242,202), and 2.49(50,441,401,403).

The new mineral is associated with dolomite, calcite, phlogopite, fluorapatite, pyrite, pyrrhotite, chalcopyrite, serpentine, and nenaokivcheite that occur in carbonatite veins at Neskevaara Hill, in the central part of the Vuorijarvi complex, Northern Karelia, Russia. The new mineral name is for the holotype locality and the prevalence of Fe at the indicated crystal-structure site. The mineral also occurs with calcite, labuntsovite-Fe, donnayite-(Y), and bitumen within a vein of K-feldspar and calcite at the Kirovskii apatite mine, Mount Kukisvumchorr, Khibiny alkaline massif, Kola Peninsula, Russia. Type material is in the Fersman Mineralogical Museum, Moscow, Russia. J.L.J.
NEVADAITE*


The mineral occurs as pale green to turquoise radial clusters, spherules, and drusy prismatic crystals, elongate [001] and up to 1 mm long. Electron microprobe analysis gave CuO 9.24, ZnO 0.11, Al$_2$O$_3$ 27.07, Fe$_2$O$_3$ 0.07, V$_2$O$_5$ 4.24, P$_2$O$_5$ 32.54, H$_2$O (calc.) 23.48, F 9.22, O = F 3.88, sum 102.09 wt%, corresponding to (Cu$_{2.75}$Zn$_{0.25}$Al$_{0.75}$V$_{0.02}$Fe$_{0.02}$)$_2$Si$_{2.75}$O$_{6.94}$F$_{2.51}$OH$_{4.54}$ (H$_2$O)$_{2.02}$, with the end-member composition Cu$_2$Al$_2$O$_5$F$_4$.

Vitreous luster, pale blue streak, brittle, conchoidal fracture, no cleavage or parting. H = 3, nonfluorescent. D$_{\text{max}}$ = 2.54, D$_{\text{calc}}$ = 2.55 g/cm$^3$ for Z = 1. Optically biaxial positive, $\alpha = 1.540$, $\beta = 1.548$, $\gamma = 1.553$, 2V$_{\text{meas}}$ = 76°, 2V$_{\text{calc}}$ = 76°, orientation $X = c$, $Y = a$, $Z = b$, moderate pleochroism. $X$ = pale greenish blue, $Y$ = very pale greenish blue, $Z$ = blue. Z = 2.726. Single-crystal X-ray structure study ($R = 0.040$) indicated orthorhombic symmetry, space group $P2_12_12_1$; $a = 12.122(4)$, $b = 18.961(8)$, $c = 4.951(2)$ Å as refined from a Debye–Scherrer powder pattern (114 mm, CuK$_\alpha$ radiation) with strong lines of 9.535(80,020), 6.077(100,200), 5.618(90,130), 3.430(40,041), 2.983(60,241), 2.661(40,061), 1.844(40,352), and 1.740(40,641).

The mineral formed as supergene coatings in association with fluellite, wavellite, strengite–variscite, hewettite, torbernite, and other minerals at the open-pit Gold Quarry mine near Carlin, Eureka County, Nevada (hence the new mineral name). Type material is in the Systematic Reference Series housed at the Geological Survey of Canada, Ottawa. J.L.J.

ZINCOSPIROFFITE*


Three homogeneous aggregates of the mineral, amounting to 400 × 4000 mm$^2$ and with the largest area 15 × 350 mm, were observed in a polished section of oxidized gold ore. Electron microprobe analysis gave CuO 0.02, MnO 0.01, MgO 0.24, FeO 0.20, ZnO 24.57, PbO 1.64, AuO 0.11, SO$_2$ 0.03, SeO$_2$ 0.17, TeO$_2$ 71.90, sum 98.89 wt%, corresponding to (Zn$_{0.04}$Pb$_{0.05}$Mg$_{0.04}$Fe$_{0.02}$)$_2$Te$_{2.75}$O$_{6.94}$F$_{2.51}$OH$_{4.54}$, ideally Zn$_2$Te$_2$O$_6$, which is the Zn-dominant analog of spiroffite. Gray color, vitreous luster, translucent, dark green streak, soft, brittle, uneven fracture, $D_{\text{calc}}$ = 5.57 g/cm$^3$ for Z = 4. Weakly anisotropic in reflected light, no internal reflection, weakly bireflectant and pleochroic. Representative reflectance percentages (SiC standard, air) for $R_{\text{min}}$ and $R_{\text{max}}$ are 7.0, 7.5 (470 nm), 7.1, 7.3 (546), 6.1, 6.2 (589), and 4.4, 5.0 (650). Raman spectra indicate an absence of H$_2$O, and are in good agreement with the spectrum of synthetic Zn$_2$Te$_2$O$_6$. An X-ray powder pattern (114 mm Debye–Scherrer, CuK$_\alpha$ radiation) yielded six weak lines and one of medium intensity: 4.758(11), 3.240(111), 2.928(m,113), 2.820(204), 2.155(023,511), 1.985(223), and 1.599(425), from which $a = 12.72$, $b = 5.15$, $c = 11.82$ Å, $\beta = 99.2^\circ$.

The mineral contains blebs of gold and occurs as a rim on, or a replacement of, calaverite. One of the three aggregates in the section is coated by hematite. The new mineral was discovered in ore from the Zhongshangou gold deposit (115° 05′ E, 40° 55′ N), wherein the Au occurs in Te-bearing quartz veins. The new mineral name recognizes the relationship to spiroffite. Type material is in the Geological Museum of China, Beijing. J.L.J.

AUS, RHI$_3$, (Cu,$\text{Cu}$,$\text{Ag}$)$_2$Zn


SODIUM-STRONTIUM MICA


The mineral forms flakes, scales, and finely scaly aggregates in margins roughly 0.1 mm thick around corundum (ruby). Sixteen electron microprobe analyses gave SrO contents ranging from 3.06 to 6.02 wt%, and the analysis with the highest SrO content is SiO$_2$ 38.27, Al$_2$O$_3$ 40.57, Cr$_2$O$_3$ 2.71, FeO 0.62, CaO 1.32, SrO 6.02, Na$_2$O 3.04, K$_2$O 0.54, sum 93.09 wt%, corresponding to (Na$_{0.05}$Sr$_{0.25}$Al$_{2}$Si$_{2}$O$_{6}$OH)$_2$, ideally Na$_2$Al$_2$Si$_2$O$_6$OH, for 12 anionic charges, but the ideal formulation, Na$_{1.25}$Sr$_{0.75}$Al$_{2}$Si$_2$O$_6$OH, was chosen because of crystallographic evidence for Na in the octahedral sheet. Transparent, light emerald-green color, $H = 4$, $VHN = 217(37)$, perfect {001} cleavage, uneven fracture, $D_{\text{calc}} = 3.07(3)$, $D_{\text{calc}} = 2.99$ g/cm$^3$ for Z = 4, not fluorescent or cathodoluminescent. Optically biaxial negative, $\alpha = 1.642(2)$, $\beta = 1.635(2)$, $\gamma = 1.598(2)$, $2V_{\text{meas}} = 60–80^\circ$, $2V_{\text{calc}} = 70^\circ$. Pleochroism $X = $ pale green, $Z = $ yellowish green. Positive elongation; straight extinction. The infrared spectrum has features at 3625, 3450, 1008, 716, 544, and 488 cm$^{-1}$.

There are endothermic effects at 850 and 1100 ºC. Single-crystal X-ray structure study ($R = 0.073$) showed the mineral to have monoclinic symmetry, space group C2/c, polytype 2M1, $a = 5.161(4)$, $b = 8.907(7)$, $c = 19.31(2)$ Å.
\[ \beta = 94.83(8)^\circ. \] The strongest lines of powder pattern (camera) are 9.63(30), 4.34(100), 3.13(90), 2.50(100), 2.07(80), 1.893(80), 1.591(80), 1.469(100), 1.018(80), and 1.008(80).

The mineral occurs in plagioclase in the Rubinovyy Log (Ruby Ravine) prospect, which is on the left bank of the Ma-
kar-Ruz’ River, Polar Urals, Russia. This area has economic Cr deposits associated with the Rayizskiy ultramafic massif. Associated minerals include corundum (ruby), albite, phlogopite, pargasite, and chromite.

**Discussion.** Loss on ignition at 1000 °C of a bulk sample was 6.02 wt%, but the ideal H2O content calculated for the above analysis is 4.37 wt%, giving a total of 97.46 wt%. No specific areas are provided on the structural refinement or the crystallographic evidence for Na in the octahedral sheet. Because wt% SrO exceeds wt% Na2O, the authors propose that the mineral is new. However, Na > Sr in the interlayer site no matter how the formula is written, and the mineral is not a distinct species. The authors quote Milan Rieder as naming the mica “strontian octa-sodian brammalite”, which would be an appropriate name for a mineral having the formula calculated for the composition highest in SrO and assuming the division between true and interlayer-deficient micas is based on total interlayer cations, not interlayer positive charges. However, the other three analyses given in the paper correspond to strontian paragonite because total interlayer cations are 0.85–0.89. The hardness and significant proportion of divalent cations on the interlayer site suggest that this mineral is intermediate between true and brittle micas. **E.S.G.**

**NEW DATA**

**Cavolinite**


A controversial mineral first described in 1825, “cavolinite” had not been accepted as a valid species by several investigators, who equated it with nepheline, microsommite, and davyne. Powder and Weissenberg X-ray diffraction data of 15 museum specimens (supplemented by single-crystal refinement of one specimen) from the only known locality of the mineral, given as Monte Somma or Vesuvius, Italy, showed six specimens to be quadridavyne, six to be davyne, and three to be scapolite, plagioclase, and anorthoclase. Electron microprobe analyses and Raman spectroscopy of the 12 specimens in the cancrinite group confirmed the identifications of quadridavyne and davyne. **E.S.G.**

**Clinobarylite**


Re-investigation of the optical and X-ray diffraction properties of crystals from the type locality showed the mineral to be orthorhombic rather than monoclinic (Am. Mineral., 89, p. 249, 2004; Doklady Chem., 388, 23–25, 2003). Optically biaxial negative, \( \alpha = 1.695(5) \), \( \beta = 1.702(5) \), \( \gamma = 1.708(8) \), \( 2V_{\text{calc}} = 85(5)^\circ \), \( X = b, Y = c \). Single-crystal X-ray structure study (\( R_1 = 0.03 \)) gave orthorhombic symmetry, \( Pmn2_1 \), with \( a = 11.650(10), b = 4.922(4), c = 4.674(4) \text{Å}, D_{\text{calc}} = 4.01 \text{g/cm}^3 \text{ for } Z = 2 \). Strongest lines of the powder pattern (57 given, diffractometer, CuK\( \alpha \) radiation) are 4.529(20,110), 3.388(56,011), 3.042(26,310), 2.986(28,301), 2.929(58,211), 2.458(100,020), 2.404(22,120), 2.336(31,002), 2.265(20,220), 2.206(20,411), 2.171(20,202), 2.077(23,501,320,112), and 1.532(21,131). Clinobarylite and barylite are framework silicates consisting of chains of BeO tetrahedra parallel to [001] and cross-linked by SiO\( 4 \) groups. The BeO tetrahedra in a given chain point either up or down [001], as do also the SiO\( 4 \) tetrahedra. In clinobarylite all of the structural units have the same orientation, whereas in barylite up-and-down orientations alternate in [100]. Units of like orientation constitute sheets parallel to (100) in barylite, equivalent to (010) in clinobarylite, so that these minerals can formally be considered as the 2O and the 1O polytypes of BaBe2Si2O7, respectively. **E.S.G.**

**Gaitite**


Single-crystal X-ray structure study (\( R_1 = 0.018 \)) of gaitite gave triclinic symmetry, space group \( P1 \), \( a = 5.899(1), b = 6.978(1), c = 5.755(1) \text{Å}, \alpha = 97.41(3), \beta = 109.08(3), \gamma = 108.09(3)^\circ, D_{\text{calc}} = 3.708 \text{g/cm}^3 \text{ for } Z = 1 \). Gaitite is isotopic with collinsite, and zirconoselite is isotopic with roselite. **J.L.J.**

**Paranatrolite**


Single-crystal X-ray structure study (\( R_1 = 0.0352 \)) of paranatrolite of composition \( \text{Na}_{1.156}\text{K}_{0.22}\text{Ca}_{0.06}(\text{Si}_{2.76}\text{Al}_{2.24}\text{O}_{10})_3\text{.1H}_{2}\text{O} \), from the Khibiny massif, Kola Peninsula, Russia, indicated the mineral to be monoclinic, space group \( \text{Cc}, a = 6.5952(12), b = 19.204(3), c = 9.955(2) \text{Å}, \beta = 107.737(12)^\circ, Z = 4 \). **J.L.J.**

**Discarded Mineral**

**Elfstorpite**


Elfstorpite was originally described in 1893 as a hydrous, pale yellow, transparent Mn arsenate, but re-investigation of the type material and of a specimen from the type locality has shown that the composition, powder X-ray diffraction pattern, and unit-cell parameters of the mineral are very close to those of allactite. The historical priority belongs to allactite, which was described in 1884, and the CNMMN has therefore approved the discardation of elfstorpite. **E.S.G.**