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NEW MINERAL NAMES*

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Barquillite*

A. Murciego, I. Pascua, J. Babkine, Y. Dusausoy, O. Medenbach, H.-J. Bernhardt (1999) Barquillite, $Cu_2(Cd,Fe)GeS_4$, a new mineral from the Barquilla deposit, Salamanca, Spain. Eur. J. Mineral., 11, 111–117.

The mean of nine listed electron microprobe analyses is Cu 30.67, Ag 0.26, Cd 20.38, Fe 2.20, Mn 0.43, Zn 0.09, Ge 14.99, Sn 0.17, Ga 0.05, Bi 0.16, Sb 0.09, S 29.42, sum 98.91 wt%, corresponding to $(Cu_{2.10}Ag_{0.01})_{\Sigma 2.11}(Cd_{0.79}Fe_{0.17}Mn_{0.03}Zn_{0.01})_{\Sigma 1.00}(Ge_{0.90}Sn_{0.01})_{\Sigma 0.91}S_{3.98}$ for 8 atoms. The mineral occurs as plates, up to 50 μm across and <20 μm thick, either isolated or in rosette-like aggregates. Opaque, metallic luster, polishes well, *H* = 4–4½, D_{calc} = 4.53 g/cm^3 for *Z* = 2. In reflected light, gray with a pale violet tint, very weakly pleochroic, bireflectant, and anisotropic. Reflectance percentages are given in 20 nm steps from 400 to 700 nm; representative values in air and in oil are, respectively, 24.42, 10.79 (460), 24.18, 10.49 (480), 23.29, 9.85 (540), 23.19, 9.69 (560), 23.04, 9.59 (580), 23.07, 9.54 (600), 23.28, 9.72 (640), and 23.46, 9.91 (660). The X-ray powder pattern (Gandolfi, Cu*K*α radiation) has 11 diffraction lines, of which 3 may be from contaminants; the remaining lines are similar to those of briarite, and by analogy, *a* = 5.45(4), *c* = 10.6(1) Å, tetragonal symmetry. Strongest lines are 3.10(100,112), 1.92(80,220), 1.89(70,204), 1.64(60,312), and 1.60(20,303,116).

The mineral, which is the Cd analog of briartite, is associated with chalcopyrite, tetrahedrite, mawsonite, mohite, antimonpearceite, bornite, stannoidite, native bismuth, and bismuthinite. These surround flakes of mica and fill interstices among them in wall rock adjacent to veins at the Fuentes Villanas Sn-Li mine near the village of Barquilla, southwestern Salamanca, Spain. Compositions of barquillite show extensive Cd-for-Fe substituion, and extend to at least Cd:Fe = 1:1. Type material is in several repositories, among which are the Museo Geominero in Madrid, Spain, and the Institut für Mineralogie, Bochum, Germany. **J.L.J.**

Chloromenite*

L. Vergasova, S. Krivovichev, T. Semenova, S. Filatov, V. Ananiev (1999) Chloromenite, $Cu_9O_2(SeO_3)_4Cl_6$, a new mineral from the Tolbachik volcano, Kamchatka, Russia. Eur. J. Mineral., 11, 119-123.

The mean of four listed electron microprobe analyses is CuO 46.23, ZnO 5.94, SeO_2 34.37, Cl 16.57, O ≡ Cl 3.74, sum 99.36 wt%, corresponding to $(Cu_{7.71}Zn_{0.97})_{\Sigma 8.68}Se_{4.11}O_{13.80}Cl_{6.20}$. The mineral occurs as transparent plates, up to 0.2 mm long, flattened on $\{\bar{1}01\}$, elongate [111] and rarely [010], showing {001}, $\{\bar{1}01\}$, {110}, {011} $\{\bar{3}12\}$ and poorly developed $\{\bar{3}01\}$ and {310}. Tobacco-green color, vitreous luster, yellowish green streak, plastic tenacity, perfect {101} cleavage, VHN_5 = 62, nonfluorescent, soluble in cold, dilute acid, D_{calc} = 4.15 g/cm^3 for *Z* = 2. Optically biaxial negative, α = 1.87(1), β = 1.92(1), γ = 1.94(1), $2V_{meas}$ = 66, $2V_{calc}$ = 63°, *Y* = *b*, *Z* = ~*c*, pleochroism α = green, β = light brownish green, γ = black brownish green, γ > α > β. Single-crystal X-ray structure study (*R* = 0.051) indicated monoclinic symmetry, space group *I*2/*m*; *a* = 14.11(1), *b* = 6.274(2), *c* = 13.00(1) Å, β = 113.0(1)° as refined from a diffractometer pattern (Cu*K*α radiation) with strongest lines of 11.29(63, $\bar{1}01$), 5.56(83,011), 3.450(100,103), and 2.486(61,303,402). Variation in intensities results from selective orientation, and diffraction lines with the strongest calculated intensities are 11.29(65), 5.56(81), 3.450(72), 3.133(100), and 2.253(42).

The mineral occurs on larger grains of melanothallite associated with an unidentified selenite and sophiite in a fumarole in the North Breakthrough of the great Tolbachik Fissure Eruption, Kamchatka Peninsula, Russia. The new name alludes to the color and chemical composition (derivation from the Greek for "green", which is an indication of a Cl content, and the Greek for "moon", an indication of the presence of Se, e.g., as in chalcomenite, cobaltomenite). Type material is in the Mineralogical Museum of the Department of Mineralogy, Saint Petersburg State University, and in the Mining Museum of the Mining Institute, Saint Petersburg, Russia. **J.L.J.**

Clinocervantite*

R. Basso, G. Lucchetti, L. Zefiro, A. Palenzona (1999) Clinocervantite, β-Sb_2O_4, the natural monoclinic polymorph of cervantite from the Cetine mine, Siena, Italy. Eur. J. Mineral., 11, 95–100.

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*Before publication, minerals marked with an asterisk were approved by the Commission on New Minerals and Mineral Names, International Mineralogical Association.

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Electron microprobe analysis gave Sb 79.19 wt%, corresponding to $Sb_{2.00}O_4$. The mineral occurs as aggregates of prismatic crystals, elongate [001] and up to 0.2 mm in length, showing dominant {110} and subordinate {122} and {211}. Colorless, transparent, vitreous luster, white streak, brittle, uneven fracture, *H* not determinable, no cleavage, commonly twinned on (100), nonfluorescent, D_{calc} = 6.72 g/cm^3 for Z = 4. Optically biaxial, α' = 1.72, γ' = 2.10. Single-crystal X-ray structure study (R = 0.020) indicated monoclinic symmetry, space group *C*2/*c*; a = 12.060(5), b = 4.832(2), c = 5.384(3) Å, β = 104.60(2)° as refined from a Guinier powder pattern (Cu*K*α radiation) with strongest lines of 3.244(VS,111), 2.920(M,400), 2.877(S,31$\bar{1}$), 1.619(M,222,71$\bar{1}$), and in good agreement with data for the synthetic analog (PDF 17–620).

The mineral occurs in cavities in waste rock at the Cetine di Cotorniano Sb mine, central Tuscany, Italy, in association with valentinite, tripuhyite, bindheimite, and rosiaite. The new name refers to the polymorphic relationship with the orthorhombic analog, cervantite. Type material is in the Dipartimento di Scienze della Terra, Sezione di Mineralogia, Universitá di Genova, Italy. **J.L.J.**

Grumiplucite*

P. Orlandi, A. Dini, F. Olmi (198) Grumiplucite, a new mercury–bismuth sulfosalt species from the Levigliani mine, Apuan Alps, Tuscany, Italy. Can. Mineral., 36, 1321–1326.

Electron microprobe analysis gave Hg 25.4, Bi 57.6, S 17.4, sum 100.4 wt%, corresponding to $Hg_{0.94}Bi_{2.04}S_4$. The mineral occurs as gray-black prismatic crystals up to 1 mm long and 0.1 mm across, elongate [010]. Metallic luster, almost micaceous {001} cleavage, typically twinned on (001), tenacity, streak, and *H* not stated, D_{calc} = 7.02 g/cm^3 for Z = 4. In reflected light, creamy white color, low bireflectance, distinctly anisotropic. Representative reflectance percentages for R_1 and R_2 in air are, respectively, 35.7, 37.8 (470 nm), 35.4, 37.5 (546), 34.9, 37.0 (589), and 33.9, 35.8 (650); values in oil are 23.2, 25.0 (470), 23.0, 25.0 (546), 22.0, 24.0 (589), and 20.4, 22.7 (650). Single-crystal X-ray study indicated monoclinic symmetry, space group *C*2, *Cm*, or *C*2/*m*, a = 14.164(5), b = 4.053(1), c = 13.967(3) Å, β = 118.28(3)°, in good agreement with data for synthetic $HgBi_2S_4$, which has the space group *C*2/*m* (PDF 26–880). Strongest lines of the X-ray powder pattern (114 mm Gandolfi, Cu*K*α radiation) are 3.05(s,$\bar{3}$12,$\bar{1}$13), 2.914(ms,310), and 2.865(ms,203,$\bar{3}$13).

The mineral occurs with mercury, cinnabar, and mercurian sphalerite in cavities in quartz-carbonate veins at the Levigliani mercury deposit in the Apuan Alps. The new name is for the amateur mineralogical group Gruppo Mineralogico e Paleontologico Lucchese, which provided the specimens for the study. Type material is in the Museo di Storia Naturale e del Territorio, University of Pisa, Italy. **J.L.J.**

Hydrowoodwardite*

T. Witzke (1999) Hydrowoodwardite, a new mineral of the hydrotalcite group from Königswalde near Annaberg, Saxony/Germany and other localities. Neues Jahrb. Mineral. Mon., 75–86.

Wet-chemical and TG analysis of type material from the St. Briccius mine, Königswalde, gave CuO 28.38, ZnO 0.41, Al_2O_3 19.20, SiO_2 5.60, Na_2O 0.10, SO_3 15.50, H_2O 30.10, sum 99.39 wt%, corresponding to $[Cu_{0.48}Zn_{0.01}Al_{0.51}(OH)_{1.99}][(SO_4)_{0.26}Na_{0.005}(H_2O)_{1.27}]$; the SiO_2 is apparently amorphous silica, and synthetic analogs are Si-free. Analyses of samples from the Gelbe Birke mine in Schwarzenberg, Saxony, the St. Christoph mine, Bärenhecke, Saxony, published analyses of material from Carnarvonshire, Wales, and compositions of synthetic analogs indicate that the general formula is $[Cu_{1-x}Al_x(OH)_2][(SO_4)_{x/2}(H_2O)_n]$, with x <0.67 and n > about 3x/2. The mineral occurs as blue stalactitic aggregates and botryoidal porous crusts; vitreous luster, translucent, pale blue streak, uneven fracture, *H* not stated, no cleavage, brittle upon loss of water, D_{meas} = 2.33, D_{calc} = 2.48 g/cm^3 for Z = 3. Refractive indices n_{min} = 1.549, n_{max} = 1.565 [presumably uniaxial positive], nonpleochroic. Indexing of the X-ray powder pattern (diffractometer, Cu*K*α radiation) gave trigonal symmetry, probable space group $R\bar{3}m$ by analogy with other minerals of the hydrotalcite group, a = 3.070(7), c = 31.9(2) Å. Strongest of the nine lines listed are 10.5(100,003), 5.26(17,006), 3.50(6,009), 2.60B(5,012), and 1.524B(4,110). Dehydrates to woodwardite in a dry atmosphere, whereupon c' decreases from 10.65 Å to 8.8 Å, but can be rehydrated by immersion in water.

The mineral is the Cu analog of glaucocerinite and carrboydite, and the new name refers to the relationship with woodwardite. Associated minerals at the Gelbe Birke mine are woodwardite, schulenbergite, namuwite, langite, linarite, and others; occurs on gneiss at the St. Bricius mine, and is also known to occur at the St. Johannes mine near Marienberg, Saxony, in association with allophane. Type material is in the Mineralogical Collection of the Bergakademie Freiberg, Germany. **J.L.J.**

Kastningite*

J. Schlüter, K.-H. Klaska, K. Friese, G. Adiwidjaja (1999) Kastningite, $(Mn,Fe,Mg)Al_2(PO_4)_2(OH)_2\cdot 8H_2O$, a new phosphate mineral from Waidhaus, Bavaria, Germany. Neues Jahrb. Mineral. Mon., 40–48.

Electron microprobe analysis gave MnO 11.30, FeO 6.07, MgO 0.64, Al_2O_3 24.49, P_2O_5 37.96, H_2O (by difference) 19.54, sum 100 wt%, corresponding to $(Mn_{0.66}Fe_{0.35}Mg_{0.06})_{\Sigma 1.07}Al_2(P_{2.23}O_8)(OH)_2\cdot 3.56H_2O$; the mineral immediately decomposes under the electron beam, thus accounting for poor agreement with the ideal formula which, for Mn:Fe = 2:1, requires MnO 9.90, FeO 5.01, Al_2O_3 21.36, P_2O_5 29.74, H_2O 33.98 wt%. The mineral occurs as sprays of thin, tabular [001] crystals, up to 2 mm long, showing {001}, {111}, {$\bar{1}$11}, {100}. White, beige, or colorless, translucent to transparent, vitreous luster, white streak, soft, nonfluorescent, D_{meas} = 2.35, D_{calc} = 2.379 g/cm^3 for Z = 2. Optically biaxial negative, α = 1.5665, β = 1.5740, γ = 1.5815, $2V_{meas}$ = 94.7°, $2V_{calc}$ = 90.6°. Single-crystal X-ray structure study (R = 0.0519) indicated triclinic symmetry, space group $P\bar{1}$; a = 7.0102(3), b = 10.2050(7), c = 10.5040(7) Å, α = 71.82(1), β = 89.62(1), γ = 69.90(1)° as refined from a powder pattern (diffractometer, Cu*K*α radiation) with strongest lines of 9.917(100,001), 6.541(36,100), 4.957(50,002), 3.095(28), and 3.001(30).

The mineral, which is an alteration product of primary phosphates, is associated with variscite and paravauxite in a pegmatite that is mined for feldspar at the Silbergrube quarry, Waidhaus, Bavaria, Germany; also known to occur in the Hagendorf-Süd pegmatite in the same area. The new name is for the discoverer, mineral collector Jürgen Kastning of Reinbek bei Hamburg, Germany. Type material is in the Mineralogical Museum of the University of Hamburg. The mineral is the Al analog of stewartite and is a polymorph of mangangordonite. **J.L.J.**

Thomasclarkite-(Y)*

J.D. Grice, R.A. Gault (1998) Thomasclarkite-(Y), a new sodium – rare-earth-element bicarbonate mineral species from Mont Saint-Hilaire, Quebec. Can. Mineral., 36, 1293–1300.

The mineral occurs as white to yellow individual crystals up to 2 mm long, and as groups of well-formed, blocky, pseudotetragonal crystals, showing {010}, {0$\bar{1}$0}, {111}, {1$\bar{1}$1}, {$\bar{1}\bar{1}$1}, {101}, and {$\bar{1}$01}. Vitreous luster, white streak, brittle, uneven fracture, perfect {010} cleavage and good {101} parting, *H* = 2–3, nonfluorescent, effervesces strongly in 10% HCl, ubiquitous merohedral twinning on {101}, D_{meas} = 2.30(2), D_{calc} = 2.34 g/cm^3 for Z = 1. Electron microprobe analysis (H_2O and CO_2 by TGA) gave Na_2O 6.72, CaO 0.33, Y_2O_3 14.52, La_2O_3 8.63, Ce_2O_3 17.11, Pr_2O_3 1.92, Nd_2O_3 5.63, Sm_2O_3 1.22, Gd_2O_3 1.22, Dy_2O_3 2.04, Er_2O_3 2.20, Yb_2O_3 1.32, ThO_2 0.54, F 0.17, CO_2 12.00, H_2O 26.60, O ≡ F 0.07, sum 102.10 wt%, corresponding to $(Na_{0.80}Ce_{0.18}Ca_{0.02})_{\Sigma 1.00}(Y_{0.48}La_{0.20}Ce_{0.21}Pr_{0.04}Nd_{0.12}Sm_{0.03}Gd_{0.03}Dy_{0.04}Er_{0.04}Yb_{0.03})_{\Sigma 1.22}(HCO_3)[O_{6.97}F_{0.03}]H_{9.93}$, ideally $Na(Y,REE)(HCO_3)(OH)_3 \cdot 4H_2O$. Losses by TGA were 20.5 wt% between 20 and 110 °C (H_2O), and 18.1 wt% between 380 and 510 °C (attributed to OH and HCO_3). Optically biaxial negative, pseudo-uniaxial, ω = 1.540(4), ε = 1.40(2), some grains with 2*V* = 5°. Single-crystal X-ray structure study (*R* = 0.055) of a twinned crystal indicated monoclinic symmetry, space group *P*2, *a* = 4.556(1), *b* = 13.018(6), *c* = 4.556(2) Å, β = 90.15(3)°. Strongest lines of the powder pattern (114 mm Gandolfi, Cu*K*α radiation) are 12.97(100,010), 4.32(50,110,011), 3.133(50,$\bar{1}$11,111), and 2.016(40,230,032).

The mineral, formerly designated UK93, occurs as a late-stage hydrothermal product in an alkaline pegmatite dike at the Poudrette quarry, Mont Saint-Hilaire, Rouville County,Quebec. The new name is for Professor Thomas Henry Clark (1893–1996) of McGill University. Type material is in the Canadian Museum of Nature, Ottawa, **J.L.J.**

Wiluite*

L.A. Groat, F.C. Hawthorne, T.S. Ercit, J.D. Grice (1998) Wiluite, $Ca_{19}(Al,Mg,Fe,Ti)_{13}(B,Al,\square)_5Si_{18}O_{68}(O,OH)_{10}$, a new species isostructural with vesuvianite, from the Sakha Republic, Russian Federation. Can. Mineral., 36, 1301–1304.

Electron microprobe analysis gave SiO_2 36.11, Al_2O_3 12.03, TiO_2 0.8, MgO 6.48, FeO 1.21 (titration), Fe_2O_3 2.28, CaO 35.54, Ce_2O_3 0.18, B_2O_3 3.06, F 0.5, H_2O (induction furnace) 0.61, O ≡ F 0.24, sum 99.2 wt%, corresponding to $(Ca_{18.97}Ce_{0.03})_{\Sigma 19}(Al_{6.53}Ti_{0.30}Fe^{3+}_{0.86}Mg_{4.81}Fe^{2+}_{0.50})_{\Sigma 13}(B_{2.63}Al_{0.53}\square_{1.84})_{\Sigma 5}Si_{17.99}O_{68}[(OH)_{2.03}O_{7.97}]_{\Sigma 10}$. Occurs as dark green crystals, up to 3 × 3 × 5 cm and slightly elongate [001], showing {100} and {101}, with minor {110} and {001}. Vitreous luster, colorless streak, *H* = 6, brittle, irregular fracture, poor {100} cleavage, nonfluorescent, no twins observed, D_{meas} = 3.36(3), D_{calc} = 3.358 g/cm^3 for Z = 2. Colorless and nonpleochroic in transmitted light, uniaxial positive, ω = 1.721(2), ε = 1.725(2); strongly sector-zoned, with some sectors biaxial. Single-crystal X-ray study indicated tetragonal symmetry, space group *P*4/*nnc*; *a* = 15.7521(7), *c* = 11.7169(9) Å as refined from a powder pattern (diffractometer, Cu*K*α radiation) with strongest lines of 2.776(100,342), 2.617(61,252), 2.592(43,224), 2.491(61,260), and 1.66(26,346).

The new name is for the type locality, the Wilui River, Sakha Republic (Yakutia), at which wiluite is associated with grossular in a fine-grained matrix of serpentine minerals, carbonate, pyrite, chlorite, and “achtarandite”; also known to occur in Templeton Township, Quebec, and at the Bill Waley mine, Tulare County, California. Type material is in the Canadian Museum of Nature, Ottawa. Wiluite is isostructural with vesuvianite, and contains essential B. **J.L.J.**

Wooldridgeite*

F.C. Hawthorne, M.A. Cooper, D.I. Green, R.E. Starkey, A.C. Roberts, J.D. Grice (1999) Wooldridgeite, $Na_2CaCu^{2+}_2(P_2O_7)_2(H_2O)_{10}$: A new mineral from Judkins quarry, Warwickshire, England. Mineral. Mag., 63, 13–16.

Electron microprobe analysis gave Na_2O 8.33, K_2O 0.17, CaO 7.73, MgO 0.24, CuO 20.24, P_2O_5 39.37, H_2O (calc.) 24.72, sum 100.80 wt%, corresponding to $(Na_{1.96}K_{0.03})Ca_{1.00}(Cu_{1.85}Mg_{0.04})P_{4.04}O_{14}(H_2O)_{10}$. Occurs as intergrown crystalline aggregates and as rhombic-dipyramidal, isolated, 50–200 μm crystals. Blue-green color, vitreous luster, transparent, pale blue streak, brittle, irregular fracture, no cleavage, *H* = 2–3, nonfluorescent, D_{calc} = 2.279 g/cm^3 for Z = 8. Colorless and nonpleochroic in transmitted light, α = 1.508(1), β = 1.511(1), γ = 1.517(1), $2V_{meas}$ = 76.2(5), $2V_{calc}$ = 71(10)°, no dispersion. Single-crystal X-ray study indicated orthorhombic symmetry, space group *Fdd*2, *a* = 11.938(1), *b* = 32.854(2), *c* = 11.017(1) Å. Strongest lines of the powder pattern (114 mm Debye–Scherrer, Cu*K*α radiation) are 8.23(30,040), 6.52(100,131), 4.05(40,260), 3.255(40,262), and 2.924(40,371).

The mineral is an oxidation product associated with primary calcite, chalcopyrite, and bornite. The new name is for amateur mineralogist James Wooldridge (1923–1995), who discovered the mineral. Type material is in the Manchester Museum, Manchester, England. **J.L.J.**

$Nd(CO_3)[(OH),H_2O]$

R. Miyawaki, S. Matsubara, K. Yokoyama, K. Takeuchi (1998) An ancylite group mineral in alkali olivine basalt from Saga Prefecture, Japan. Mem. National Sci. Mus. Tokyo, 31, 49–56.

One of three similar electron microprobe analyses gave La_2O_3 20.18, Pr_2O_3 6.88, Nb_2O_3 32.42, Sm_2O_3 3.98, Gd_2O_3 1.97, Dy_2O_3 0.35, Y_2O_3 0.56, CaO 3.98, SrO 0.31, CO_2 (calc.) 20.80, H_2O (calc.) 4.92, sum 96.35 wt%, corresponding to $(Nd_{0.81}La_{0.52}Pr_{0.18}Sm_{0.10}Gd_{0.05}Y_{0.02}Dy_{0.01})_{\Sigma 1.69}(Ca_{0.30}Sr_{0.01})_{\Sigma 0.31}(CO_3)_2$

$(OH)_{1.69}\cdot 0.31H_2O$, simplified as $(Nd,La,Ca)(CO_3)[(OH),H_2O]$. The mineral occurs as pinkish purple to white aggregates of rhombic-dipyramidal subhedral crystals, each up to 10 μm. Readily soluble with effervescence in HCl. Indexing of the X-ray powder pattern (114 mm Gandolfi, Cu*K*α radiation), which is similar to that of calcio-ancylite-(Nd), gave $a = 4.980(5)$, $b = 8.497(7)$, $c = 7.236(6)$ Å; strongest lines are 4.31(vvs,110), 3.69(s,111), 2.93(s,102), and 2.32(vs,131). The mineral is associated with lanthanite-(Nd), calcite, olivine, and amorphous silica (the last commonly as spheres) that occur in cavities in alkali basalt at Niikoba, Higashi Matsurra-gun, Saga Prefecture. **J.L.J.**.

New Data

Aerinite

J. Rius, F. Plana, I. Queralt, D. Louër (1998) Preliminary structure type determination of the fibrous aluminosilicate "aerinite" from powder X-ray diffraction data. Anales de Química Int. Ed., 94, 101–106.

Chemical analysis of a sample from Huesca-Lleida, Spain, gave SiO_2 43.16, TiO_2 0.66, P_2O_5 0.08, Al_2O_3 13.05, Fe_2O_3 7.25, FeO 3.26 (Fe partitioned in accordance with previous Mössbauer data), MgO 6.41, MnO 0.09, CaO 11.11, Na_2O 0.55, K_2O 0.42, H_2O 13.73, CO_2 <0.005, sum 99.77 wt%, corresponding to $(Ca_{3.71}Na_{0.33}K_{0.17})_{\Sigma 4.21}(Mg_{2.98}Mn_{0.02})_{\Sigma 3.00}[Si_{13.47}Al_{4.35}Ti_{0.16}P_{0.02}O_{42}](OH)_6\cdot nH_2O$, wherein n = ~11.3, simplified as $(Ca,Na)_4Mg_3(Fe^{3+},Fe^{2+},Al)_3[Si_{13.5}Al_{4.5}O_{42}](OH)_6\cdot nH_2O$. The mineral occurs as blue fibrous aggregates in which fiber diameters are 0.3–0.4 μm. Indexing of the X-ray powder pattern, from which the structure was derived, indicated hexagonal symmetry, space group *P*3*c*1 or *P*3, $a = 16.872(1)$, $c = 5.2256(5)$ Å. The new unit cell, symmetry, and formula are preliminary. **J.L.J.**

Blatterite

M.A. Cooper, F.C. Hawthorne (1998) The crystal structure of blatterite, $Sb^{5+}_3(Mn^{3+},Fe^{3+})_9(Mn^{2+},Mg)_{35}(BO_3)_{16}O_{32}$, and structural hierarchy in Mn^{3+}-bearing zigzag borates. Can. Mineral., 36, 1171–1193.

Electron microprobe analysis of blatterite from Långban, Sweden, gave Sb_2O_5 12.80, TiO_2 0.19, Al_2O_3 0.33, Fe_2O_3 1.96, Mn_2O_3 16.03 (Mn partitioned on the basis of the structural formula), MnO 38.89, MgO 14.89, B_2O_3 (calc.) 14.63, sum 99.72 wt%, corresponding to$Sb^{5+}_{3.01}(Mn^{3+}_{7.73}Fe^{3+}_{0.93}Al_{0.25}Ti^{4+}_{0.09})_{\Sigma 9.00}(Mn^{2+}_{20.87}Mg_{14.06})_{\Sigma 34.93}(BO_3)_{16}O_{32}$. Single-crystal X-ray structure study ($R = 0.043$) gave orthorhombic symmetry, space group *Pnnm*, $a = 37.654(8)$, $b = 12.615(3)$, $c = 6.2472(8)$ Å, $D_{calc} = 4.25$ g/cm^3 for $Z = 2$.

Crystal-chemical considerations indicate that "Mg blatterite" (*Am. Mineral*., 82, p. 210, 1997) is the Mg analog of blatterite, that the formula of orthopinakiolite is $Mn^{3+}_7[Mn^{2+},Mg)_xFe^{3+}_y\square_{1/2(y-1)}]_{\Sigma 17}(BO_3)O_{16}$, and that takéuchiite is $Mn^{3+}_{11}\{Mn^{2+},Mg)_xFe^{3+}_y\square_{1/2(y-1)}]_{\Sigma 25}(BO_3)O_{24}$. **J.L.J.**

Samarskite minerals

S.L. Hanson, W.B. Simmons, A.U. Falster, E.E. Foord, F.E. Lichte (1999) Proposed nomenclature for samarskite-group minerals: new data on ishikawaite and calciosamarskite. Mineral. Mag., 63, 27–36.

Electron microprobe analysis of the type specimen of ishikawaite from Ishikawa Prefecture, Japan, has shown that the specimen contains intergrown ferrocolumbite, but the results conform with the accepted ABO_4 formula in which U and Nb are dominant in A and B, respectively. Indexing of the X-ray powder pattern (27 lines listed) of a heated sample gave a monoclinic cell with $a = 5.562$, $b = 9.934$, $c = 5.243$ Å, $\beta = 93.9°$.

Electron microprobe analysis of a Ca-rich sample from Mitchell County, North Carolina gave a composition showing Ca predominance in A, and a Ca-dominant analysis has also been reported in *Am. Mineral*., 78, 419–424 (1993). Indexing of the X-ray powder pattern of the heated Mitchell County mineral gave $a = 5.632$, $b = 9.912$, $c = 5.221$ Å, $\beta = 93.87°$.

Discussion. The authors note that the Ca-dominant mineral corresponds to calciosamarskite, which has not been officially discredited by the CNMMN. It is also stated that the CNMMN has accepted classification of the samarskite minerals as having an ABO_4 formula. Some analyses (*Am. Mineral*., 78, 419–424) show Fe predominance in A, but proportions of Fe^{2+} and Fe^{3+} have been calculated rather than directly determined. A resolution of this issue, and the attendant nomenclature, would be useful. **J.L.J.**

Tienshanite

M.A. Cooper, F.C. Hawthorne, E.S. Grew (1998) Refinement of the crystal structure of tienshanite: short-range-order constraints on chemical composition. Can. Mineral., 36, 1305–1310.

Electron microprobe analysis of tienshanite from Dara-i-Pioz, Tajikistan, gave Na_2O 4.35, K_2O 2.09, CaO 1.61, Y_2O_3 0.83, BaO 18.23, MnO 6.32, FeO 1.03, ZnO 0.51, Nb_2O_5 4.66, Ta_2O_5 0.11, TiO_2 7.26, SiO_2 43.09, B_2O_3 (calc.) 8.28, F 1.36, H_2O 0.34, O ≡ F 0.57, sum 99.50 wt%, corresponding to $Na_{7.08}K_{2.24}Y_{0.37}Ca_{1.45}Ba_{6.00}(Mn_{4.50}Fe_{0.72}Zn_{0.32}Ti_{0.42})_{\Sigma 5.96}(Ti_{4.17}Nb_{1.77}Ta_{0.03})_{\Sigma 5.97}B_{12}Si_{36.19}F_{3.61}(OH)_{1.89}$ for $(OH + F) = 5.5$ and 125 anions. Single crystal X-ray structure study ($R = 0.022$) confirmed the previous crystallographic data and led to a revision of the formula to $KNa_3(Na,K,\square)_6(Ca,Y,REE)_2Ba_6(Mn^{2+},Fe^{2+},Zn,Ti)_6(Ti,Nb)_6Si_{36}B_{12}O_{114}[O_{5.5}(OH,F)_{3.5}]F_2$. **J.L.J.**

Vuonnemite

T.S. Ercit, M.A. Cooper, F.C. Hawthorne (1998) The crystal structure of vuonnemite, $Na_{11}Ti^{4+}Nb_2(Si_2O_7)_2(PO_4)_2O_3(F,OH)$, a phosphate-bearing sorosilicate of the lomonosovite group. Can. Mineral., 36, 1311–1320.

Electron microprobe analysis of vuonnemite from the Lovozero massif, Kola Peninsula, Russia, and single-crystal

X-ray structure study (R = ~0.02) of the Kola mineral and a grain from the Ilímaussaq intrusion, Greenland, showed the new formula to be that given above. The triclinic symmetry and cell dimensions were confirmed, and the space group was established as $P\bar{1}$. **J.L.J.**

WC

S.F. Glavatskikh, M.E. Generalov, N.V. Trubkin (1997) New data on natural tungsten carbide. Transactions Russ. Acad. Sci., Earth Sci. Sections, 352(1), 81–83 (English translation from Doklady Akad. Nauk, 352, 226–229).

Angular grayish black grains of WC were extracted from basaltic scoria taken at a depth of 1.8 m at the Trubka fumarole of the Great Tolbachik Fissure Eruption of 1975–1976, Kamchatka Peninsula, Russia. The grains are polycrystalline aggregates, up to 0.5 mm across, in which individuals are short prisms rarely exceeding 10 μm. Electron microprobe analysis gave 87.41 W, 0.26 Si wt%. Electron diffraction patterns are consistent with hexagonal symmetry, space group $P6_3/mmc$, a = 2.90(1), c = 2.84(1) Å; the X-ray powder pattern (10 lines listed) is in good agreement with data for synthetic WC. Tremolite, poorly crystalline graphite, corundum, and glass of variable composition occur as microinclusions. Moissanite and cohenite have also been identified as occurring at the Trubka fumarole.

Discussion. For previous reports of WC occurrences, see *Am. Mineral*., 74, p. 948 (1989). **J.L.J.**