American Mineralogist, Volume 83, pages 185–189, 1998

NEW MINERAL NAMES*

John L. Jambor,[1] Edward S. Grew,[2] and Andrew C. Roberts[3]

[1] Department of Earth Sciences, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada
[2] Department of Geology, University of Maine, Orono, ME 04459-5711, U.S.A.
[3] Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0G1, Canada

Caoxite*

R. Basso, G. Lucchetti, L. Zefiro, A. Palenzona (1997) Caoxite, $Ca(H_2O)_3(C_2O_4)$, a new mineral from the Cerchiara mine, northern Apennines, Italy. Neues Jahrb. Mineral. Mon., 84–96.

The mineral occurs as spherulitic and isolated aggregates, up to 0.5 mm across, consisting of colorless, stocky crystals that are tabular on {010} and up to 100 μm long. Transparent, vitreous luster, white streak, brittle, good {010} cleavage, uneven fracture, nonfluorescent, D_{calc} = 1.87 g/cm^3 for $Z = 2$. Optically biaxial negative, $\alpha' = 1.483$, $\beta_{calc} = 1.516$, $\gamma' = 1.533$, $2V_{meas} = 70(2)°$. Electron microprobe analysis gave CaO 30.03 (28.85–31.97) wt%; the ideal formula contains C_2O_3 39.54 and H_2O 29.67 wt%, from which the empirical formula is $Ca_{0.979}C_{2.007}H_{6.021}O_7$, ideally $Ca(H_2O)_3(C_2O_4)$. Single-crystal X-ray structure study ($R = 0.036$) indicated triclinic symmetry, space group $P1$, $a = 6.097(1)$, $b = 7.145(1)$, $c = 8.434(1)$ Å, $\alpha = 76.54(1)$, $\beta = 70.30(1)$, $\gamma = 70.75(1)°$. Strongest lines of a Gandolfi powder pattern (Cr$K\alpha$ radiation) are 7.92 (M,001), 5.52(VS,100,011), 5.26 (M,101), 4.99(M,110), 3.643(M,$11\bar{1}$,012), 2.834(S,210), and 2.732(M,022), in good agreement with data for the synthetic analog.

The mineral, which is thought to be hydrothermal, is associated with quartz, barite, and an unidentified Mn oxide in open fractures, 0.5 mm wide, that cut mineralized layers rich in Mn-Ba at the Cerchiara Mn (mainly braunite) mine near Faggiona, eastern Liguria. The new name is derived from the acronym Centennial Anniversary of X-rays and also alludes to the composition, calcium oxalate. Type material is in the Sezione di Mineralogia, Dipartimento di Scienze della Terra, Università di Genova, Italy. **J.L.J.**

Galileiite*

E.J. Olsen, I.M. Steele (1997) Galileiite: A new meteoritic phosphate mineral. Meteoritics Planetary Sci., 32, A155–A156.

Electron microprobe analysis gave Na_2O 5.87, K_2O 0.04, Cr_2O_3 0.07, MnO 3.98, FeO 49.0, P_2O_5 40.2, sum 99.16 wt%, corresponding to $Na_{2.02}K_{001}Cr_{0.01}Fe_{7.26}Mn_{0.60}P_{6.04}O_{24}$, ideally $(Na,K)_2(Fe,Mn,Cr)_8(PO_4)_6$. Occurs as grains up to 30 μm; pale amber color, sectile and soft, $H = \leq 4$, no cleavage or parting. Transparent and colorless in transmitted light, uniaxial positive, $\omega = 1.72(3)$, $\epsilon = 1.75(5)$. The X-ray powder pattern was indexed on the basis of its similarity to those of chladniite and johnsomervilleite; trigonal symmetry, inferred space group $R\bar{3}$, $a = 14.98$, $c = 41.66$ Å, $Z = 36$. Strongest lines of the pattern (57 mm Gandolfi, Fe radiation, 26 lines) are 4.13(80,303), 3.47(50,00.12), 3.21(50,042), 3.01(90,321), 2.93(50,229), 2.85(50,407), 2.71(100,30.12), and 2.57(50,502).

The mineral occurs within troilite nodules in the Grant IIIB and four other IIIAB iron meteorites. The new name is for astronomer Galileo Galilei (1564–1642). Type material is to be deposited in the Smithsonian Institution, Washington, DC. **J.L.J.**

Gordaite*

J. Schlülter, K.-H Klaska, K. Friese, G. Adiwidjaja, G. Gebhard (1997) Gordaite, $NaZn_4(SO_4)(OH)_6Cl \cdot 6H_2O$, a new mineral from the San Francisco mine, Antofogasta, Chile. Neues Jahrb. Mineral. Mon., 155–162.

Electron microprobe analysis gave Na_2O 9.15, ZnO 52.85, SO_3 15.33, Cl 6.46, H_2O (CHN) 12.33, Cl ≡ O 1.46, sum 94.66 wt%; semiquantitative analysis by AAS gave about 5.5 wt% Na_2O, and ideal values are Na_2O 4.95, ZnO 51.99, SO_3 12.79, Cl 5.66, H_2O 25.89, sum 100 wt%. The mineral occurs as colorless flakes associated with zincian paratacamite, and as interlocking anhedral plates up to 20 mm across. Transparent colorless to translucent white, vitreous to pearly luster, mica-like appearance. Flexible but not elastic, perfect {001} cleavage, $H = 2½$, nonfluorescent, soluble in cold HCl or HNO_3, $D_{meas} = 2.627$, $D_{calc} = 2.640$ g/cm^3 for $Z = 2$. Optically uniaxial negative, $\omega = 1.5607(8)$, $\epsilon = 1.5382(4)$. Single-crystal X-ray structure study indicated trigonal symmetry, space group $P3$; $a = 8.363(4)$, $c = 13.018(6)$ Å as refined from a diffractometer powder pattern (Cu$K\alpha$ radiation) with strongest lines of 12.950(100,001), 6.501(23,002), 4.339(15,003), 3.258 (14,004), and 2.967(10,014).

The mineral is associated with zincian paratacamite, anglesite, hemimorphite, christelite, and quartz in oxidized vein material from the San Francisco base metal mine in the Sierra Gorda, northeast of Antofogasta. Gordaite is probably also the unnamed mineral that occurs

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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.

0003–004X/98/0102–0185$05.00

on sulfide samples retrieved from the Juan de Fuca Ridge (ICDD–PDF 41–1421). The new name alludes to the type locality. Type material is in the Mineralogical Museum of the University of Hamburg, Germany. **J.L.J.**

Ilinskite*

L.P. Vergasova, T.F. Semenova, R.R. Shuvalov, S.K. Filatov, V.V. Anan'yev (1997) Ilinskite $NaCu_5O_2(SeO_3)_2Cl_3$—a new mineral of volcanic exhalations. Doklady Akad. Nauk, 353(5), 641–644 (in Russian).

Nine electron microprobe analyses averaged Na_2O 3.76 (3.11–4.11), K_2O 0.94 (0.59–1.23), CuO 53.54 (52.59–54.90), SeO_2 31.27 (30.58–32.11), Cl 13.93 (13.07–14.22), O ≡ Cl 3.14 (2.95–3.21), sum 100.30 (99.01–101.98) wt%, corresponding to $(Na_{0.88}K_{0.14})_{\Sigma 1.02}Cu_{4.86}O_{2.16}(Se_{2.04}O_6)Cl_{2.84}$, ideally $NaCu_5O_2(SeO_3)_2Cl_3$ for O + Cl = 11. The mineral forms tabular crystals, elongate [001], flattened on (010), up to 0.35 mm long and 0.05 mm thick. The best developed forms are {010}, which is striated [001], and {100}, {101}, {110}, {111}, and {121}. Emerald green color, light green streak, transparent, vitreous luster, brittle, $VHN_{1.5}$ = 10 (6–14), perfect {100} cleavage, D_{calc} = 4.08 g/cm³ for Z = 4; stable in air and soluble in dilute acids. Optically biaxial negative, α = 1.845(5), β = 1.965(5), γ = 1.975(5), $2V_{meas}$ = 20(5), $2V_{calc}$ = 31°, no dispersion. Markedly pleochroic, with X, Z, = green, Y = yellow-green; optical orientation $X = a$, $Y = c$, $Z = b$. Single-crystal X-ray structure study (R = 0.044) indicated orthorhombic symmetry, space group *Pbnm*, a = 10.482(1), b = 17.732(2), c = 6.432(1) Å as refined from the powder pattern (21 lines given). Strongest lines are 8.84(60,020), 5.24(100,200), 3.251(40,320), 2.955(27,060), 2.626(25,400,222), and 2.513(12,420).

A product of fumarole activity at the Large Tolbachik fissure eruption, Kamchatka Peninsula, Russia, the mineral is present in exhalative deposits in the North Break and South Break, where T = 200–230 °C, and the occurrence is at a depth of 20 cm in the South Break. The mineral forms single crystals and sheath-like aggregates, locally associated with cotunnite, sofiite, and other Se-bearing minerals, and locally occurring on a scoria-like substrate of amorphous Al-Mg-Na sulfates containing finely dispersed Fe oxides, galena, moissanite, and possible native Al. The new mineral name is for Georgiy Alekseyevich Il'inskiy (1927–1996). Type material is in the Mining Museum of the Saint Petersburg Mining Institute, and in the Museum of the Mineralogy Department of the Saint Petersburg State University, Russia. **E.S.G.**

Isolueshite*

A. Chakhmouradian, V. Yakovenchuk, R.H. Mitchell, A. Bogdanova (1997) Isolueshite: A new mineral of the perovskite group from the Khibina alkaline complex. Eur. J. Mineral., 9, 483–490.

One of the four electron microprobe analyses of a zoned crystal, and the range for the four zones, gave Na_2O 13.65 (12.05–13.65), K_2O 0.07 (0.04–0.09), CaO 2.82 (1.48–2.82), SrO 2.03 (1.44–2.03), La_2O_3 5.17 (5.17–7.83), Ce_2O_3 3.12 (3.12–7.44), Pr_2O_3 0.15 (0.15–0.45), Nd_2O_3 0.18 (0.18–0.82), Sm_2O_3 –(0–0.03), ThO_2 1.15 (1.15–4.88), FeO 0.02 (0–0.03), TiO_2 17.05 (17.05–23.00), Nb_2O_5 53.41 (40.68–53.41), Ta_2O_5 0.58 (0.39–0.79), sum 99.40 (98.37–99.40) wt%, corresponding to $(Na_{0.73}Ca_{0.08}La_{0.05}Ce_{0.03}Sr_{0.03}Th_{0.01})_{\Sigma 0.93}(Nb_{0.66}Te_{0.35})_{\Sigma 1.01}O_{3.00}$, ideally $(Na,Ca,La)(Nb,Ti)O_3$. Occurs as euhedral crystals, to 0.3 mm, showing cubic {100} and rhombic dodecahedral {110} faces, with the latter finely striated. Brownish black color, pale yellow streak, adamantine luster, brittle, uneven fracture, H = 5½, D_{meas} = 4.72(1), D_{calc} = 4.68 g/cm³ for Z = 1. Optically isotropic, n = 2.20. Bluish in reflected light, reddish brown internal reflection, reflectance percentages 16.05 (460 nm), 15.50 (500), 15.00 (540), 14.70 (580), 14.45 (620), 14.35 (660), and 14.35 (700). The infrared spectrum is similar to that of the perovskite group. Single-crystal X-ray study indicated cubic symmetry, possible space group *Pm*3*m*, a = 3.911(3) Å as refined from a diffractometer pattern (Cu$K\alpha$ radiation, 10 lines listed) with strongest lines at 3.915(35,100), 2.765(100,110), 1.953(53,200), and 1.594(30,211).

The mineral is associated with microcline and sodalite in a hydrothermally altered pegmatite vein at the Kukisvumchorr apatite mine in the southern part of the Khibina alkaline complex, Kola Peninsula, Russia. The new name alludes to the isometric symmetry and relationship to lueshite, the orthorhombic polymorph. Type material is in the Mining Museum of the Mining Institute, Saint Petersburg, Russia, and in the Mineralogical Museum of Saint Petersburg State University. **J.L.J.**

Koragoite*

A.V. Voloshin, Ya.A. Pakhomovskiy, A.Yu. Bakhchisaraytsev, D.Yu. Pushcharovskiy, N.A. Yamnova (1997) Koragoite—a new mineral from granitic pegmatites of the southwestern Pamirs, Tajikistan. Doklady Akad. Nauk, 353(4), 516–518 (in Russian).

Electron microprobe analysis gave TiO_2 0.49, FeO 0.69, MnO 19.97, Nb_2O_5 36.84, Ta_2O_5 9.46, WO_3 32.16, sum 99.61 wt%, corresponding to $Mn_{3.71}Fe_{0.13}Ti_{0.08}Nb_{3.65}Ta_{0.56}W_{1.83}O_{20}$, which in terms of the structural formula $A_3B_3(A,B)_2C_2O_{20}$, is $(Mn_{2.87}Fe_{0.13})_{\Sigma 3.00}(Nb_{2.53}Ta_{0.39}Ti_{0.08})_{\Sigma 3.00}(Nb_{1.12}Mn_{0.84})_{\Sigma 1.96}(W_{1.83}Ta_{0.17})_{\Sigma 2.00}O_{20}$, ideally $Mn_3Nb_3(Nb,Mn)_2W_2O_{20}$. The mineral forms thin, commonly bent, platy crystals 1–3 mm across and 0.1–0.3 mm thick. Red to dark red-brown color, grayish brown streak, metallic luster, H = 4–5, VHN_{50} = 550, no cleavage, nonfluorescent, D_{calc} = 4.70(1) g/cm³ for Z = 2. In reflected light, gray with red internal reflection, clearly anisotropic. Reflection percentages (Si standard) are 19.2, 18.0 (470 nm); 18.5, 17.5 (546); 19.3, 18.5 (589); and 16.5, 16.0 (650). Single-crystal X-ray structure study (R = 0.052) indicated monoclinic symmetry, space group $P2_1$, a = 24.73(3), b = 5.056(3), c = 5.760(3) Å, β = 103.50(7)°, α-PbO_2 structure type. Strongest lines of the powder pattern (114 mm camera, Fe*K*α radiation, 34 lines given) are 6.0(50,400), 3.74(80,21$\bar{1}$,011), 3.69 (80,60$\bar{1}$,401), 2.98(100,61$\bar{1}$,411), 1.783(50,80$\bar{3}$,203), 1.744(60,10.20), 1.732(70,812), and 1.456(50,82$\bar{3}$,223,23$\bar{2}$).

The mineral occurs in albite associated with zircon and W-bearing varieties of stibiocolumbite, pyrochlore, columbite, and ixiolite in granitic pegmatites in the southwestern Pamir Mountains, Tajikistan. The new name is for Russian geologist A.A. Korago (1942–1993). Type material is in the Fersman Mineralogical Museum, Moscow.

Discussion. A preliminary description was abstracted in *Am. Mineral.*, 81, p. 250, 1996. **E.S.G.**

Stanĕkite*

P. Keller, F. Fontan, F. Velasco Roldan, J.C. Melgarejo i Draper (1997) Stanĕkite, $Fe^{3+}(Mn,Fe^{2+}, Mg)(PO_4)O$: A new phosphate mineral in pegmatites at Karibib (Namibia) and French Pyrénées (France). Eur. J. Mineral., 9, 475–482.

Electron microprobe analysis gave Na_2O 0.13, K_2O 0.05, MgO 0.50, CaO 0.13, MnO 23.12, FeO 1.56 (Fe partitioning by Mössbauer spectroscopy), ZnO 0.22, Al_2O_3 0.01, Fe_2O_3 41.56, TiO_2 0.02, P_2O_5 31.16, sum 98.42 wt%, corresponding to $(Fe_{1.16}{}^{3+}Mn_{0.73}{}^{2+}Fe_{0.05}{}^{2+}Mg_{0.03}Na_{0.01})_{\Sigma 1.98}(P_{0.98}O_4)O$. The mineral occurs as subhedral to anhedral grains up to 2 cm long, elongate [001], some with prominent {120}; black color, dark brown streak, weakly submetallic luster, brittle, spintery fracture, {001} parting, H = 4–5, nonfluorescent, D_{meas} = 3.80, D_{calc} = 4.09 g/cm³ for Z = 16. Nearly opaque in transmitted light; pale gray in reflected light, weak bireflectance and pleochroism, moderately anisotropic, reddish yellow to brownish red internal reflection. Reflectance percentages are given in 20 nm steps from 400 to 700 nm in air and in oil. Single-crystal X-ray structure study indicated monoclinic symmetry, space group $P2_1/a$, a = 11.844(3), b = 12.662(3), c = 9.989(3) Å, β = 105.93°; a prominent subcell is present in which b' = ½b. Strongest lines of the X-ray powder pattern (diffractometer, Cu*K*α radiation) are 3.412(38,122), 3.259(50,202), 2.971(100,14$\bar{1}$), 2.857(58,023), and 2.810(85,40$\bar{2}$).

The mineral, which belongs to the triploidite group, is associated with other phosphates that occur in the Okatjimukuja pegmatite at Karibib, Namibia (type locality). The mineral is also known from two other pegmatites in Namibia, and in pegmatites at Cap de Creus, Spain, and Albéres, eastern end of the French Pyrénées. The new mineral name is for Josef Stanĕk of Masarykov University, Brno, Czech Republic. Type material is at the University of Stuttgart, Germany, and the Musée de l'Ecole des Mines de Paris. **J.L.J.**

Ternovite*

V.V. Subbotin, A.V. Voloshin, Y.A. Pakhomovskii, Y.P. Men'shikov, G.F. Subbotina (1997) Ternovite, $(Mg,Ca)Nb_4O_{11}\cdot nH_2O$, a new mineral and other hydrous tetraniobates from carbonatites of the Vuoriyarvi massif, Kola Peninsula, Russia. Neues Jahrb. Mineral. Mon., 49–60.

Electron microprobe analysis gave MgO 3.82, CaO 1.54, SrO 0.20, BaO 1.25, Fe_2O_3 0.18, TiO_2 0.14, Nb_2O_5 69.20, H_2O by difference 23.67, sum 100 wt%, corresponding to $(Mg_{0.73}Ca_{0.21}Ba_{0.06}Sr_{0.01})_{\Sigma 1.01}$ $(Nb_{3.98}Fe_{0.02}Ti_{0.01})_{\Sigma 4.01}O_{11}\cdot 10.1H_2O$, ideally $(Mg,Ca)Nb_4O_{11}\cdot nH_2O$, where n = 8 to 12. Other analyses give intermediate Mg-Ca-Na values that suggest solid solution with hochelagaite and franconite. Occurs as white spherulites, to 0.5 mm in diameter, consisting of radiating blades averaging 0.1 × 0.003 × 0.005 mm. White streak, silky luster, brittle, uneven fracture, H = 3, D_{meas} = 2.95(2), D_{calc} = 2.99(1) g/cm³ for Z = 4. Insoluble in dilute HCl. The infrared spectrum has a general similarity to that of franconite. Optically biaxial negative, parallel extinction, $Z \parallel$ elongation, α = 1.725(3), β = 1.830(5), γ = 1.845(5), $2V_{calc}$ = 39.5(1)°. Indexing of the X-ray powder pattern by analogy with those of hochelagaite and franconite indicated monoclinic symmetry, a = 20.656, b = 13.062, c = 6.338Å, β = 91.90°; strongest lines of the pattern (diffractometer, Cu*K*α radiation) are 10.33(100,200), 5.16(7,400), 4.56(8,021), 3.15(17,10$\bar{2}$), 3.12(15,102), and 3.06(7,20$\bar{2}$,1$\bar{1}$2).

Ternovite, franconite, and hochelagaite occur as late-stage hydrothermal minerals in dissolution voids that formed as a result of dolomitization of pyrochlore-bearing calcite carbonatites intersected in drill core from the central part of the Vuoriyarvi massif. Associated late-stage minerals are dolomite, magnesite, serpentine, barite, pyrite, ancylite-(Ce), and belkovite. The new name is for Russian geologist V.I. Ternovoi (1928–1980), one of the explorers of the Kola Peninsula. Type material is in the Fersman Mineralogical Museum, Moscow. **J.L.J.**

Utahite*

A.C. Roberts, J.A.R. Stirling, A.J. Criddle, M.C. Jensen, E.A. Moffatt, W.E. Wilson (1997) Utahite, a new mineral and associated copper tellurates from the Centennial Eureka mine, Tintic District, Juab County, Utah. Mineral. Record, 28, 175–179.

Electron microprobe analysis gave CuO 25.76, ZnO 15.81, TeO_3 45.47, H_2O (by difference) 12.96, sum 100 wt%, corresponding to $Cu_{4.98}Zn_{2.99}(Te^{6+}O_4)_{3.98}(OH)_{7.98}\cdot 7.1H_2O$, ideally $Cu_5Zn_3(TeO_4)_4(OH)_8\cdot 7H_2O$. The infrared spectrum has absorption bands for (OH) and H_2O. The mineral occurs as compact aggregates to 0.6 mm, and as sheaves to 0.2 mm. Crystals in both are in parallel to subparallel growths; maximum length of individuals is 0.3 mm, prismatic to bladed habit, elongate [001], some showing major {010} and minor {001}. Pale blue as single crystals, blue-green in aggregates, vitreous to pearly luster, translucent, pale blue streak, brittle, uneven fracture, H = 4–5, nonfluorescent, D_{calc} = 5.34 g/cm³ for Z = 1. Pale brown in reflected light, green internal reflection, slightly bireflectant, nonpleochroic,

n_{calc} = 1.83–1.90. Single-crystal X-ray study indicted triclinic symmetry, space *P*1 or *P*1; *a* = 8.794(4), *b* = 9.996(2), *c* = 5.660(2) Å, α = 104.10(2)°, β = 90.07(5)°, γ = 96.34(3)° as refined from a powder pattern (114 mm Debye–Scherrer, Cu*K*α radiation) with strongest lines of 9.638(100,010), 8.736(50,100), 4.841(100,020), 2.747 (60,022), and 2.600(45,$\bar{3}01$,$\bar{3}1\bar{1}$).

The mineral is an oxidation product deposited with cesbronite and other Cu-Zn-Te tellurates on quartz in dump material at the Centennial Eureka gold mine near Eureka, Utah. Type material is in the Systematic Reference Series housed at the Geological Survey of Canada, Ottawa, as part of the National Mineral Collection; the polished section used for the microprobe analysis is in the National History Museum, London, England. **J.L.J.**

Telargpalite, Bi analog

N.D. Tolstykh, A.P. Krivenko (1995) The composition of telargpalite. Doklady Akad. Nauk, 341(5), 666–668. [English translation in Trans. Russ. Acad. Sci., Earth Sci. Sect., 344(7), 114–118, 1996].

Electron microprobe analyses of 12 grains of telargpalite from gabbro-norites of the Pan intrusion, Kola Peninsula, Russia, correspond to the formula $(Pd,Ag,Pt)_3(Te,Bi,Pb)$. The range in compositions is $(Pd_{1.96–1.76}Ag_{1.22–1.07}Pt_{0–0.02})_{\Sigma 2.98–3.04}$-$(Te_{0.89–0.43}Bi_{0.51–0.07}Pb_{0.10–0.01})$. Analysis of the Bi analog gave Pd 43.03, Ag 23.78, Pt 0.26, Te 11.42, Bi 22.01, Pb 0.69, sum 101.19 wt%, corresponding to $(Pd_{1.96}Ag_{1.07}Pt_{001})_{\Sigma 3.04}$-$(Bi_{0.51}Te_{0.43}Pb_{0.02})_{\Sigma 0.96}$. **J.L.J.**

$Pb_{2.87}Ag_{0.24}(Bi,Sb)_{1.89}(S,Se,Te)_{5.89}$

N.J. Cook (1997) Bismuth and bismuth-antimony sulphosalts from Neogene vein mineralisation, Baia Borsa area, Maramures, Romania. Mineral. Mag., 61, 387–409.

Electron microprobe analysis gave Ag 2.25, Pb 51.26, Bi 25.27, Sb 5.15, S 16.22, Se 0.06, Te 0.09, sum 100.27 wt%, corresponding to $Pb_{2.87}Ag_{0.24}(Bi_{1.40}Sb_{0.49})_{\Sigma 1.89}$ $(S_{5.87}Se_{0.01}Te_{0.01})_{\Sigma 5.89}$, possibly a lillianite-like homologue with N = 5. A detailed description of the analyzed mineral is not given. **J.L.J.**

$Cu_4Al_3(OH)_{14}F_3(H_2O)_2$

R.K. Rastsvetaeva, N.V. Chukanov, V.U. Karpenko (1997) The crystal structure of a new natural compound $Cu_4Al_3(OH)_{14}F_3(H_2O)_2$. Doklady Akad. Nauk, 353(3), 354–357 (in Russian).

Electron microprobe and wet-chemical (F, H_2O) analyses gave SiO_2 0.47, Al_2O_3 23.34, CuO 46.27, SO_3 0.10, H_2O 22.30, F 8.05, O ≡ F 3.03, sum 97.50 wt%, corresponding to $Cu_{4.03}Al_{3.17}Si_{0.05}S_{0.01}H_{17.15}O_{16.03}F_{2.94}$; the formula was determined by single-crystal X-ray structure study (*R* = 0.029). The infrared spectrum has HOH deformational bands at 1560 and 1640 cm^{-1} and OH bands at 3190, 3400, 3495, and 3560 cm^{-1}. X-ray study indicated monoclinic symmetry, space group *C*2/*m*, *a* = 12.326(3), *b* = 2.907(3), *c* = 10.369(3) Å, β = 97.90(2)°, D_{calc} = 3.00 g/cm³ for *Z* = 1. The mineral occurs as deep blue, acicular crystals in cavities in a calcic vein with fluorite, malachite, and an allophane-like Cu-Al mineral at the Khaydarkan Hg-Sb deposit in Kyrgyzstan. **E.S.G.**

Tetragonal almandine-pyrope phase

J. Harris, M.T. Hutchison, M. Hursthouse, M. Light, B. Harte (1997) A new tetragonal silicate mineral occurring as inclusions in lower-mantle diamonds. Nature, 387, 486–488.

Apple green crystals, 30–100 μm in diameter, occur as inclusions in diamond from São Luiz, Brazil. The crystals typically have a cubo-octahedral morphology, but one is elongate, tabular. Electron microprobe analysis (one of three listed) gave CaO 0.09, MgO 25.63, Na_2O 0.09, NiO 0.01, MnO 0.96, FeO 4.60, Cr_2O_3 2.80, Al_2O_3 23.83, TiO_2 0.06, SiO_2 42.12, sum 100.20 wt%, corresponding to $(Mg_{2.73}Na_{0.02}Ca_{0.01}Mn_{0.03}Fe_{0.19}{}^{3+}Fe_{0.08}{}^{2+}Cr_{0.12}Al_{1.90}Si_{2.92})_{\Sigma 8.00}O_{12}$, with Fe^{3+} and Fe^{2+} partitioned on the basis of averaged results from Mössbauer data. Single-crystal X-ray structure study (*R* = 0.039) indicated tetragonal symmetry, space group $I\bar{4}2d$, *a* = 6.526(4), *c* = 18.182(9) Å, D_{calc} = 3.580 g/cm³ for *Z* = 4; the structural formula is $(Mg,Fe^{3+})(Al,Cr,Mn)_2$ $(Mg,Fe^{2+})_2Si_3O_{12}$. The inclusions are considered to be syngenetic with their diamond hosts. **J.L.J.**

Monoclinic analog of nenadkevichite

R.K. Rastvetaeva, A.V. Arakcheeva, A.P. Khomyakov (1996) Crystal structure and microtwinning of a new monoclinic analog of nenadkevichite. Doklady Akad. Nauk, 351, 207–211 (in Russian).

The mineral, which has the empirical formula $Na_{1.03}K_{1.91}Ti_{1.39}Nb_{0.61}Si_4O_{13.55}(OH)_{0.45}\cdot 2.2H_2O$, occurs as colorless, transparent tablets, 0.3–0.5 mm long, in hydrothermally altered pegmatite at Mount Koashva in the Khibina alkaline massif, Kola Peninsula, Russia. Single-crystal X-ray structure study (*R* = 0.058) indicated monoclinic symmetry, space group *C*2/*m*, *a* = 14.39(3), *b* = 13.900(6), *c* = 7.825(9) Å, β = 117.6(1)°, microtwinned on (001) and ($\bar{4}01$), formula $NaK_{1.8}\{(Ti_{0.7}Nb_{0.3})_2$-$[Si_4O_{12}](O_{1.4}OH_{0.6})\}\cdot 1.8H_2O$, D_{calc} = 2.83 g/cm³ for *Z* = 4.

Discussion. See also the data for the K analog, abstracted in *Am. Mineral.* 80, p. 633, 1995. **J.L.J.**

New Data

Erikite

I.V. Pekov, N.V. Chukanov, J.G. Rønsbo, H. Sørensen (1997) Erikite—a pseudomorph after vitusite. Neues Jahrb. Mineral. Mon., 97–112.

Erikite, a mineral not in good standing, was originally found in the Ilimaussaq alkaline complex, Greenland, and was described by Bøggild in 1903. The original material and subsequent discoveries in the Lovozero alkaline massif, Kola Peninsula, Russia, generally have been thought to be pseudomorphs containing abundant monazite or rhabdophane. A mineralogical re-examination of erikite crystals indicates that they are pseudomorphs after vitusite-(Ce). **J.L.J.**

WC

S.F. Glavatskikh, M. Ye. Generalov, N.V. Trubkin (1997) New data on a natural tungsten carbide. Doklady Akad. Nauk, 352(2), 226–229 (in Russian).

Electron microprobe analysis gave W 87.41, Si 0.26, sum 87.67 wt%; ideal WC contains W 93.87, C 6.13 wt%, and the low analytical value for W is likely attributable to the presence of fine porosity and fine inclusions of, e.g., graphite. The WC occurs as polycrystalline aggregates, up to 0.5 mm across, with a gray-black color and dull luster. The microcrystals in these aggregates are equant, stubby prisms, most of which are only a few micrometers across, but a few are >10 μm. The prismatic grains have angles close to 60° and 90°. $VHN_{100} = 1700$ (1600–1780). Markedly anisotropic in reflected light. Electron diffraction patterns indicated hexagonal symmetry, space group $P6_3mmc$, $a = 2.90(1)$, $c = 2.84(1)$ Å; weak extra diffraction spots suggest the presence of a superstructure. The X-ray powder pattern (10 lines given) has strongest lines of 2.84(50,001), 2.52(100,010), 1.888(90,011), 1.238(50,012), and 1.155(50,021), in good agreement with data for synthetic WC.

The mineral is an exhalative product that occurs in the magnetic fraction separated from basaltic scoria at the Trubka fumarole, North Break of the Large Tolbachik fissure eruption, Kamchatka Peninsula, Russia. Included in the WC are tremolite, corundum, disordered graphite, and silica glass containing variable amounts of S, Cl, Al, K, Ca, Ti, and Fe. The WC is inferred to have sublimated from a gas phase as a result of breakdown of metallo-organic compounds of W.

Discussion. See also *Am. Mineral.*, 74, p. 948, 1989, for reports of other occurrences of WC. **E.S.G.**

Yukonite

D.R. Ross, J.E. Post (1997) New data on yukonite. Powder Diffraction, 12, 113–116.

Electron microprobe analysis of type yukonite gave Fe_2O_3 38.3, CaO 11.8, As_2O_5 33.8, Al_2O_3 0.6, MgO 0.3, K_2O 0.2, H_2O (by difference) 15.0, sum 100 wt%, corresponding to $(Ca_{6.44}K_{0.13}Mg_{0.23})_{\Sigma 6.80}(Fe_{14.68}Al_{0.36})_{\Sigma 15.04}(AsO_4)_9O_{15.78}\cdot 25.5H_2O$. Analysis of an ‘‘asbolite’’ sample from Saalfeld, Thuringen, Germany, which is considered to represent the third occurrence of yukonite, gave Fe_2O_3 31.5, CaO 12.1, As_2O_5 38.5, Al_2O_3 1.0, MgO 0.4, K_2O 0.2, H_2O (by difference) 16.3, sum 100 wt%, corresponding to $(Ca_{5.80}K_{0.11}Mg_{0.27})_{\Sigma 6.18}(Fe_{10.61}Al_{0.52})_{\Sigma 11.13}(AsO_4)_9O_{9.34}\cdot 24.3H_2O$. Strongest X-ray lines (diffractometer, Cu$K\alpha$ radiation) of the ‘‘asbolite’’ sample are 15.7(100), 5.69(33), 3.27(57), and 2.81 Å (63); strongest lines for type yukonite are 14.1(100), 5.58(37), 3.25(57), and 2.79(60). Detection of the 14 Å line in yukonite and the formula with $(AsO_4)_9$ are new.

Discussion. A proposal for a redefinition of yukonite has not been submitted to the CNMMN. **J.L.J.**

Discredited Mineral

Donathite

P.C. Burns, F.C. Hawthorne, E. Libowitzky, N. Bordes, R.C. Ewing (1997) Donathite discredited: A mixture of two spinels. Neues Jahrb. Mineral. Mon., 163–174.

Donathite was described originally as a tetragonal spinel with $a = 8.342$, $c = 8.305$ Å, space group $P4/nnm$. Recent study (*Am. Mineral.*, 77, p. 1120, 1992) indicated that donathite is a mixture of two cubic spinels. Re-examination of the material, including Rietveld structure refinement, has shown that the predominant spinel in the mixture is cubic, space group $Fd3m$, $a = 8.3847(2)$ Å, and the minor phase is a (Mg,Al)-bearing tetragonal spinel, space group $P4_122$, $a = 5.2946(3)$, $c = 8.3144(4)$ Å. The CNMMN has approved the discreditation. **J.L.J.**