Cyanophillite*


Analyses gave CuO 36.3, 32.5; Al₂O₃ 8.5, 8.5; Sb₂O₃ 36.5, 38.3; H₂O 19.8; sum 101.1%, corresponding to 10CuO • 2Al₂O₃ • 3Sb₂O₃ • 25H₂O. The mineral is dissolved readily by cold 1:1 HCl, partly dissolved by 1:1 HNO₃. Loss of weight when heated (°C) 110° 3.4, 150° 9.5, 200° 19.8%. At 250° the mineral is decomposed and turns black.

X-ray study shows the mineral to be orthorhombic, space group Pmmb, a = 11.82, D = 3.10 calc., 3.12 meas., 3.12 calc. The strongest X-rays lines (30 given) are 6.67(6)(001), 4.84(10)(002), 2.59(6)(041,420,232), 2.44(5)(240,412,313).

Color greenish-blue, luster pearly to silky. H about 2. Optical biaxial, negative, ns a : 1.60, β : 1.66, γ : 1.675 (all ±0.002), 2V = 67° calc., X = c. Cleavage {001} perfect, another perpendicular to it (100 or 010) good to very good.

The mineral occurs as coatings on quartz and barite, as spherulitic aggregates of minute tabular crystals. Associated minerals are chalcophyllite, chrysocolla, brochantite, and tsumebite at the Clara Mine near Oberwolfach, Black Forest, Germany.

The name is for the blue color and the platy form. Type material is at the University of Stuttgart.

Discussion

A badly chosen name, sure to be confused with Kyanophilite, 32,255,701 (1947) = hydrous mica? M.F.

Gaitite*


Electron microprobe analysis (H₂O by DTA-TGA) gave As₂O₃ 50.2, CaO 24.2, ZnO 15.3, MgO 1.2, FeO 0.2, MnO 0.2, H₂O 7.8, sum 99.1%, corresponding to H₂Ca₂(Zn₀.₈₄Mg₀.₁₆Fe₀.₀₁Mn₀.₀₁)(AsO₃)₂(OH)₂, the Zn analogue talmessite. X-ray data are indexed on a cubic cell, space group F43m, a = 5.410Å, Z = 4 (Cu₃S₄). D calc. 5.61. The optical data, however, indicate that the mineral is pseudocubic, probably orthorhombic.

The strongest X-ray lines (9 given) are very close to those of the associated sphalerite (a = 5.398Å). For gaitite, 3.128(100)(111), 1.918(50)(220), 1.637(30)(311), 1.109(20)(422).

The mineral is opaque and appears bluish-white and weakly birefringent in reflected light. It is moderately anisotropic in yellow. Polishing hardness less than that of sphalerite.

Gaitite occurs as a thin, iridescent coating or as platelets about 15 microns thick, oriented along {110} cleavage planes of sphalerite from Dekalb Township, New York. Can. Mineral., 18, 519-523.

Geerite*


Electron microprobe analyses are given of 27 samples; in 10 of these Zn was not detected; they contained (range and average) Cu 61.44-76.94, 71.9; S 21.47-26.09, 23.7, Cu/S 1.44-1.62, 1.53. X-ray data are indexed on a cubic cell, space group F43m, a = 5.410Å, Z = 4 (Cu₁₆₀S). D calc. 5.61. The optical data, however, indicate that the mineral is pseudocubic, probably orthorhombic.

The strongest X-ray lines (9 given) are very close to those of the associated sphalerite (a = 5.398Å). For geerite, 3.128(100)(111), 1.918(50)(220), 1.637(30)(311), 1.109(20)(422).

The mineral is opaque and appears bluish-white and weakly birefringent in reflected light. It is moderately anisotropic in yellow. Polishing hardness less than that of sphalerite.

Geerite occurs as a thin, iridescent coating or as platelets about 15 microns thick, oriented along {110} cleavage planes of sphalerite from Dekalb Township, New York (exact locality not known). In some specimens geerite is partly or completely replaced by sionkopite. Associated minerals include calcite, malachite, azurite, brochantite, crysocolla, stibiconite, cerussite, hemimorphite, tetrabedrite, and chalcopyrite.

The name is for Adam Geer (deceased) of Utica, N.Y., who collected the material. M.F.

Gittinsite*


Electron microprobe analysis gave SiO₂ 40.8, ZrO₂ 40.3, CaO 18.4, sum 99.5%, corresponding closely to CaZrSi₅O₁₄. The X-ray pattern was indexed, by analogy with thortveitite, as monoclinic,
Jamesite*  


Microprobe analysis (standards hornblende for Fe, ZnO for Zn, PbO for Pb, synthetic Cu$_{(OH)}$(AsO$_4$) for Cu and As) gave As$_2$O$_3$ 36.2, SO$_4$ trace, Fe$_2$O$_3$ 25.5 PbO 27.1 ZnO 11.1, CuO, MnO traces, sum 99.9%, corresponding to the formula above. Jamesite is difficultly soluble in hot HNO$_3$ and HCl.

X-ray study showed the mineral to be triclinic, $P_1$, $a = 5.622$, $b = 9.593$, $c = 10.279$ Å, $\alpha = 109.80$, $\beta = 90.54$, $\gamma = 97.69^\circ$, $Z = 1$, $D$ calc. 5.10. The strongest X-ray lines (47 given) are 4.30(9)(102), 3.84(9)(122,121), 3.26(9)(112,120), 3.04(9)(032), 2.92(6)(131,113), 2.84(6)(025,203,015).

Color reddish-brown, luster subadamantine. $H \approx 3$. Optically biaxial, neg., $n_a = 1.600$, $b = 1.995$, $\gamma = 2.020$, $2V \sim 75^\circ$. Strongly pleochroic, $X$ and $Y$ pale brown, $Z$ deep reddish-brown.

Y $\angle a$ on (001) $\sim 5^\circ$, Y $\angle a$ on (010)15°. Crystals are tubular, elongated $a$, up to $0.5 \times 0.2 \times 0.05$ mm.

The mineral occurs in oxidized Pb ore of the oxidized zone of the Tsumeb mine, associated with duftite, tsuncomite, and goethite.

The name is for Christopher James, mineral engineer at the Tsumeb Mine. Type material is at the Univ. of Stuttgart, Germany, and the Smithsonian Museum, Washington. M.F.

Keithconnite*, Telluropalladinite*  


The minerals were found in the Stillwater complex, Montana. Type material is at the U.S. National Museum, Washington; Geological Survey of Canada, Ottawa, and the Royal Ontario Museum.

Keithconnite*  

Electron microprobe analyses of 4 grains gave Pd 68.7, 68.4, 71.0, 68.4; Pt, -, 0.03; Te 29.1, 28.5, 14.2, 26.3; As, -, 0.16, 6.7; Bi 1.0, 0.54, 0.96; Sn -; 0.08, 5.0, 4.5; Sb -, -, 1.4, 0.23; Pb 1.6, 0.94, -, 0.03; Hg -, 0.37, -, 0.03; sum 100.4, 99.02, 99.26, 99.43%. This corresponds to $Pd_xTe_y$ with $x \sim 0.42-0.27$.

Keithconnite is rhombohedral, space group $R3$, $a = 11.45$, $c = 11.40$ Å, $Z = 7$, very similar to synthetic $Pd_xTe_y$. The strongest X-ray lines (25 given) are 2.26(10)(214), 2.16(9)(140), 1.32(3)(3.45), 0.88(5)(2.10), 0.79(4)(758).

The color depends on the association, ranging from cream to gray. Anisotropism moderate to strong. Reflectance in air 470 nm, 44.1, 42.2; 546 nm, 46.4, 43.7; 589 nm, 48.2, 45.5; 650 nm, 51.1, 48.5%. Micro-indentation hardness (15 g load) 394–424, av. 410.

The name is for Mr. H. Keith Conn, General Technical Manager, Johns-Mansville Corp., who aided the discovery of Pt-Pd mineralization in the Stillwater Complex.

Telluropalladinite*  

Electron microprobe analyses of 7 grains gave Pd 64.6–65.4, Te 31.4–34.1, As 0.10–0.68, Bi 0.15–2.6, Sn 0.07–0.12, Pb 0.03–0.05, Hg 0.04–0.05, sum 99.82–100.17, corresponding closely to $Pd_xTe_y$.

X-ray study shows the mineral to be monoclinic, space group $P2_1/c$, $a = 7.45$, $b = 13.95$, $c = 8.45$ Å, $\beta = 105.7^\circ$, $Z = 2$, $D$ calc. 5.10. These data agree well with those for synthetic $Pd_xTe_y$. The strongest X-ray lines (30 given) are 2.237(10)(152), 2.094(7)(221), 1.943(3)(3.45), 0.885(3)(2.10), 0.791(4)(758).

Color cream with a yellowish tint. Anisotropism moderate to strong. Reflectance in air 470 nm, 44.1, 42.2; 546 nm, 46.4, 43.7; 589 nm, 48.2, 45.5; 650 nm, 51.1, 48.5%. Micro-indentation hardness (15 g load) 394–424, av. 410.

The name is for the composition. M.F.

Kingsmountite*  

**Electron microprobe analyses** gave $P_2O_5$ 36.0, 35.9, 35.9; $Al_2O_3$ 16.5, 16.8, 16.7; CaO 15.1, 15.0, 14.5; MnO 8.2, 7.8, 8.3; FeO (total Fe) 4.2, 4.2, 3.9; MgO 0.2, 0.2, 0.2; H$_2$O (by Mettler thermo-analyzer) 20.6%, corresponding to $Ca_30Al_{20}O_{90}$(Fe$_{9.5}$Mn$_{5.5}$Fe$_{4.5}$)(PO$_4$)$_6$(OH)$_4$ · 12H$_2$O, the Fe$^{2+}$ analogue of montgomeryite.

The X-ray pattern (33 lines) has strongest lines 12.28(50)(020), 5.15(100)(111), 2.950(40)(311), 2.624(60)(190). The powder data, indexed by analogy with montgomeryite, gave a unit cell with $a = 10.029, b = 24.46, c = 6.258\AA$, $\beta = 91.16^\circ$, space group $P2_1/c$. $D_{calc}$ 2.58, meas. 2.51.

Color white to very light brown, streak white. H 2½. Optically biaxial, neg., 2$V = 62^\circ$, $n_s = 1.575, n_p = 1.581, \gamma = 1.583$. Y is perpendicular to laths. The crystals are small fibers; the occurrence of cleavages could not be determined.

The name is for the occurrence at the Foote Mineral Co. spodumene mine, near the town of Kings Mountain, N.C. Type material is at the Smithsonian Institution, Washington, D.C. M.F.

**McGillite**


Electron microprobe analysis by W. H. MacLean gave SiO$_2$ 34.54, As$_2O_3 < 0.1$, MnO 47.76, FeO 4.85, MgO 1.62, ZnO < 0.1, CaO < 0.05, Cl$_2$O < 7.16, (calculated, assuming 25 anions per formula unit), $H_2O^-$ not detd., 102.29 - (O = Cl)1.44 = 100.85%, corresponding to $Mg_2Si_2O_5Cl_2$. The mineral is decomposed by HCl.

Precleaved and Laue photographs show the mineral to be rhombohedral, space group $R3m$, $a = 13.498$, $c = 85.657\AA$, $D_{calc}$ 3.071, meas. 2.98. The strongest X-ray lines (34 given) are 7.16(100)(020), 2.888(60)(400), 2.560(10)(40.16).

Color dark to light violet, luster pearly. Cleavages (010) easy and good, (1010) difficult but fair. Optically uniaxial, negative, $\alpha$(Na) $\omega = 1.6685, \epsilon = 1.6415$; occasional fragments show 2V up to 10°. Vickers hardness 278-330 kg/sq.mm with 15 g load.

The mineral occurs as fracture fillings in the Sullivan mine, Kimberley, British Columbia, associated with dark sphalerite and small amounts of boulangerite, jamesonite, galena, and quartz. It has also been found at the Kyurazawa mine, Tochigi Prefecture, Japan.

The name is for McGill University. Type material is at the Geological Survey of Canada, Ottawa, and the Redpath Museum, McGill University, Montreal. M.F.

**Mcguinnessite**


Microprobe analyses by F. E. G. gave: (1) MgO 23.7, CuO 39.6, CaO 0.07, CO$_2$ 24.73, H$_2$O (given as H$_2$O) 10.08 (calc. from 34.86% loss in TGA), sum 98.23 (av. compn. of fiber); (2) MgO 25.2, CuO 37.8 (Mg-rich rim of spherule); (3) MgO 19.4, CuO 45.7; CaO 0.08 (Cu-rich core of spherule); ratio MgO/CuO (1) 54:46; (2) 57:43; (3) 46:54. The mineral is slowly but completely dissolved by cold acids. Silica (0–6%) was present, distributed inhomogeneously throughout the spherules. Formula (Mg,Cu)$_2$(CO$_3$)(OH)$_2$. A member of the rosasite group. The DTA curve shows large endothermic breaks at 498° and 1080° and a small exothermic break at 810°.

X-ray data are indexed on a monoclinic cell with $a = 9.398$, $b = 12.011, c = 3.379\AA$, $\beta = 93.28^\circ$. Triclinic symmetry is not excluded. The strongest X-ray lines (31 given) are 6.015(100)(020), 3.694(67)(220), 2.530(25)(240), 2.139(23)(250).

The mineral occurs as spherules; the fibers are light blue-green; Cu-rich cores are a slightly darker blue, and Mg-rich rims are very pale blue-green to nearly white. Luster vitreous to silky. D meas. 3.02 (Mg-rich) to 3.22 (Cu-rich); calc. 3.076 to 3.234. H 2½, brittle, inelastic. Optically biaxial, negative, $\alpha = 1.596 - 1.607, \beta = 1.724 - 1.740$ (increasing with Cu content); $\alpha$(Na) $\omega = 1.602, \beta = 1.730, \gamma = 1.732$. Elongation negative, max. extinction $X \perp c = 11^\circ$. Weakly pleochroic, X very pale green, Y and Z light bluish-green.

The mineral occurs in serpentinized peridotite at Red Mountain, Mendocino County, California associated with vuagnatite, goethite, malachite, azurite, and chrysocolla. The spherules range from 0.1 to 2 mm in diameter. It has also been found at Gabbs, Nevada, and in Austria.


**O'Daniellite**


A previous abstract is in 66, 218-219 (1981). Additional data are given below. Microprobe analysis gave As$_2O_3$ 33.8, FeO 0.2, MgO 2.9, MnO 0.6, CaO 0.3, Na$_2$O 4.7, H$_2$O 2.8 (to 480°), sum 99.7%, corresponding to the formula (Na$_{0.95}$Ca$_{0.05}$)(Zn$_{2.6}$Mg$_{0.4}$Mn$_{0.05}$Fe$_{0.02}$H$_{0.2}$)(As$_{2.0}$O$_{12}$). Refined cell constants are $a = 12.113, b = 12.445, c = 6.793\AA$, $\beta = 112.87^\circ$, $Z = 4$, $D_{calc}$ 4.49, detd. as $> 4.24$. The strongest X-ray lines (34 given) are 6.22(10)(020), 5.59(5)(200), 3.56(7)(310), 3.26(10)(112), 2.78(8b)(022, 400, 041, 041, 330), 2.72(8b)(240, 421), 1.830(5)(243, 332), 1.687(7)(641, 204), 1.664(6)(171, 642, 460, 550).

Color pale violet, luster vitreous H = 3. Cleavages (010) and (100), perfect, also (001). Optically biaxial, positive, $\alpha = 1.745, \beta = 1.753, \gamma = 1.778$. 2V = 60°, Z = b, $Y \perp c = +18^\circ$, dispersion not observed. Associated minerals were cuprian adamite, koritnigite, prosperite. The name is for Herbert O'Daniel, 1903-1977, professor of mineralogy at Univ. Münich. Type material is at the Univ. of Stuttgart and the Smithsonian Institute. M.F.

**Paranatrolite**


The name paranatrolite is given to a new zeolite that is unstable in air and dehydrates to form tetratrololite. It has been observed only as colorless, transparent epistatic overgrowths up to 1 mm in thickness on large natrolite crystals that have been preserved in water from the time of collection. All studies were made using water-immersion mounts.
Analysis was not possible; on the assumption that it differs from tetranatrolite only in water content, the formula is calculated from the unit cell and density as Na₅Al₅Si₃O₁₄ · 3H₂O.

X-ray study shows the mineral to be pseudo-orthorhombic, monoclinic or triclinic, space group Fmmm, F2mm, or Fm2m, a = 19.07, b = 19.13, c = 6.580 Å, D calc. 2.20, meaus. 2.21. The strongest X-ray lines (19 given) are 5.92(60) (111), 4.78 (30) (040, 400), 4.44 (40) (131, 311), 2.94 (100) (3.51, 531).

H 5–5 ½. Fracture conchoidal. Under the microscope, biaxial, negative, 2V < 10°, birefringence very low, extinction slightly undulatory, ns slightly higher than those of natrolite.

Type material is at the Royal Ontario Museum, Toronto, and the National Museum of Natural Sciences, Ottawa. M.F.

Pararealgar*


The average of 2 electron microprobe analyses from Mount Washington gave As 69.81, S 29.97, sum 99.78%, corresponding to As₅S₅S₉, a new polymorph of AsS. Insoluble in H₂O, conc. HCl, HNO₃, or H₂SO₄, reacts with 40% KOH to give a dark brown precipitate.

X-ray study shows the mineral to be monoclinic, space group Pc or P2₁/m, a = 9.929, b = 9.691, c = 8.503 Å, β = 97.06°, Z = 16, D calc. 3.499, meas. 3.52. The strongest lines (24 given) are 5.56(9f ) (111), 5.14 (000) (111), 3.75 (78) (112), 3.28 (90) (221), 3.025 (51) (202), 2.79 (71) (222).


The mineral occurs as powdery to granular aggregates that replaced realgar. Maximum grain size 0.02 mm. It occurs with realgar, stibnite, tetrahedrite, arsenopyrite, arsenic, arsenolite, a-AsS, and other minerals at Mount Washington, Vancouver Island, British Columbia. It has also been found (misidentified as opal) at the Golconda mine, Humboldt Co., Nevada, at Siwash Creek, British Columbia, and at the Lenigensch quarry, Switzerland.

Type material is at the Geological Survey of Canada, Ottawa. M.F.

Petarasite*


Five electron microprobe analyses (range and av.) gave SiO₂ 42.4–43.3, 42.9; ZrO₂ 29.1–30.1, 29.5; TiO₂ 0.06–0.21, 0.07; CaO 0.65–1.15, 0.88; Na₂O 17.2–17.4, 17.3; K₂O 0.17–0.29, 0.25; H₂O 7.06–7.12, 7.09; C₁ 2.01–2.07; sum 99.30–100.69, 100.03; 0(=Cl₂) 0.45–0.47, 0.46 = 98.84–100.23, 99.57%, corresponding to (Na₅.₆₅Ca₀.₁₂K₀.₀₃)₂(Zr₂₋₄Ti₂₋₄O₁₈)(OH)₀.₆₅Cl₀.₄₃)·3.₀₁H₂O. The structural study shows 2H₂O, the excess being adsorbed or in open channels; the formula is therefore Na₅Zr₂Si₆O₁₈(OH,Cl) · 2H₂O. TGA curves show loss of weight 25–83°C 6.17–6.39, av. 6.24%; 25–110°C, 9.13–9.41, av. 9.43%.

X-ray study showed the mineral to be monoclinic, space group P2₁/m, a = 10.7956, b = 14.4928, c = 6.6229 Å, β = 113.21°, Z = 2, D calc. 2.915 meaus., 2.915 calc. The strongest X-ray lines (42 given) are 7.25 (000) (020), 6.09 (000) (010), 4.10 (100) (220), 2.92 (100) (240, 241).

Color greenish-yellow, luster vitreous. Cleavages (110) perfect, (010) very good, (001) distinct; fracture subconchoidal. H 5–5 ½. Optically biaxial, positive, ns (Na) α = 1.596, β = 1.598, γ = 1.632, 2V = 29°, calc. 28°, dispersion, r < v weak. Pleochroic, X colorless, Y and Z pale-greenish-yellow, X = b, Z = c = +41°.

The mineral occurs as irregular grains up to 10 mm across, associated with biotite, apatite, catapleiite, and zircon in a xenolith in nephelite syenite, Demix quarry, Mont St.-Hilaire, Quebec.

The name is for Dr. Peter Tarasoff, amateur mineralogist of Dollard-des-Ormeaux, Quebec. Type material is at the National Museum, Ottawa, and the Royal Ontario Museum, Toronto. M.F.

Sabinaite*


Analysis by neutron activation gave CO₂ 27.1, ZrO₂ 39.1, H₂O 0.47, TiO₂ 12.0, Na₂O 20.7, CaO 0.2, sun 99.57, corresponding to (Na₅.₇₆Ca₄.₆₅)(Zr₄.₇₄Hf₅.₃₅)₂(Ti₁₆.₇₆CO₇)₃O₇, or Na₅Zr₂Ti₂O₂₇CO₇. The mineral is decomposed with effervescence by warm HCl. The DTA curve shows endothermic peaks at 519° and between 600 and 780°; the product is monoclinic ZrO₂.

Electron diffraction patterns indicate sabinaite to be monoclinic, a = 6.605, b = 10.186, c = 37.94 Å, β = 90°, Z = 8, D calc. 3.41, meaus. 3.36. The strongest X-ray lines (33 given) are 8.93(10) (012), 2.99 (6036), 2.07 (5240), 1.84 (61), 1.64 (65).

The mineral occurs as fine-grained white, powdery coatings and chalky aggregates in a Dawsonite-rich sill associated with calcite, quartz, wehgalite, and cryolite, St. Michael, Montreal Island, Quebec. Platy, max. dimensions 0.01 × 0.001 mm. Cleavages [001] perfect, [100] good. Optically biaxial, negative, ns a = 1.74, β = 1.80, γ = 1.85, 2V = 85°, X perpendicular to the plates.

The name is for Ann Phyllis Sabina Stenson, mineralogist, Geological Survey of Canada, who collected the mineral. Type material is at the Geological Survey of Canada, Ottawa, and the Royal Ontario Museum, Toronto. M.F.

Saneroite*


Microprobe analyses of 2 zones of different colors give an average composition SiO2 39.33, MnO 40.13 (total Mn), Fe2O3 0.36 (total Fe), CaO 0.25, V2O5 6.60, As2O3 0.29, Na2O 4.53, loss wt. in TGA analysis 5.00, sum 96.94%. The 2 zones were similar in composition except for V2O5 (5.6% in dark zone, 7.6% in pale zone). Spectroscopic traces of B, Ba, Co, Cr, Cu, Li, Ni, Sr, and Ti were found. For charge balance, the Mn is calculated to be MnO 37.24, Mn2O3 6.44%. Formula Na2(V2O5)(Mn2O3)(Si11V2O3)(OH).

X-ray study showed the mineral to be triclinic, PL, a = 9.741 ± 0.005, b = 9.974 ± 0.007, c = 9.108 ± 0.005 Å, α = 92.70°, β = 117.11°, γ = 105.30°, Z = 1. The strongest X-ray lines (29 given) are 3.066(1), 3.011(1), 2.983(2), 2.835(2), 2.700(2), 2.622(2), 2.589(3), 2.525(3), 2.479(3), 2.421(2), 2.362(2), 1.830(4), 1.565(4), cubic a = 10.356 Å.

Color bright orange, luster resinous to greasy, D 3.47. Cleavage perfect in 2 directions. Optically biaxial, negative, -2V 40-45°, α = 1.720, β = 1.740-1.750, γ = 1.745-1.750, elongation positive, strongly pleochroic, X deep orange, Y lemon-yellow, Z yellow-orange, extinction oblique, max. about 15°.

The mineral occurs in veins in Mn ores of Val Greveglia, Italy, associated with quartz, barite, caryopilite, and ganophyllite.

The name is for Edoardo Saneero, Emeritus Professor of Mineralogy, Univ. of Genova; type material is at the Univ. of Genova and The Natural History Museum, Genova. M.F.

Stibiotafite*


Electron microprobe analyses (Al, Pb, Na, H2O, F by ion microprobe) gave ranges and a selected grain gave, resp.; Nb2O5 20.4-26.3, 21.6; TiO2 9.0-20.0, 19.3; TiO2 14.5-21.9, 16.5; Al2O3 2.5-0.4, 0.49; Nb2O5 22.6-27.6; PbO 0.13; SnO2 4.2-3.8, 3.9; FeO 0.5-0.7, 0.6; MnO 0.5-0.8, 0.6; CaO 14.2-14.9, 14.5; Na2O 0.30; H2O 0.30, 0.44; F2 0.15, sum 100.71 - 0 = F2.06 = 100.66%. This corresponds to (Ca11.5Na6.5Sn6O46)(Fe3O4)(Sn6O46)(Na2O4) (Ti1.5Na6.5Ti2.5Na4O46)(O6O46(OH1.21F0.09).

The strongest X-ray lines (18 given) are 2.898(10), 2.789(3), 2.893(4), 1.830(4), 1.561(2), cubic a = 10.356 Å, space group Fd3m. After heating to 700°C in air, the pattern shows no OH or H2O. Analysis gave SnO2 79.51, VO2 22.01, sum 101.32%, corresponding to Sn2O3(V2O5). The possibility that V+5 was present was disproved by the structure analysis. Insoluble in cold conc. HCl or HNO3, dissolved by aqua regia.

X-ray study shows the mineral to be monoclinic, space group C2/c, a = 17.598, b = 4.7924, c = 5.500 Å, β = 95.15°, Z = 4. D calc. 5.27. The strongest lines (36 given) are 4.646(6)(101); 3.502(7)(111); 3.173(7)(311); 2.996(10)(511, 600).

Electron microprobe analysis showed only Sb and V; IR study showed no OH or H2O. Analysis gave SnO2 79.31, VO2 22.01, sum 101.32%, corresponding to Sn2O3V2O5. The possibility that V+5 was present was disproved by the structure analysis. Insoluble in cold conc. HCl or HNO3, dissolved by aqua regia.

The mineral occurs as radiating fibrous crystals up to 2 mm in diameter. Easily split into flexible and elastic fibers. It occurs in ores of the Lake George deposit, New Brunswick, Canada, associated with antimony, stibine, selenaromite, pyrite, arsenopyrite, and sphalerite.

The name is for the composition. Type material is at the Geological Survey of Canada, and the National Museum of Natural Sciences, both in Ottawa, and the Royal Ontario Museum, Toronto. M.F.

Stibivanite*


Electron microprobe analysis (Li2O by AAS, H2O by TGA) gave P2O5 50.1, Al2O3 18.3, Na2O 20.0, Li2O 5.2, CaO 0.5, sum 100.9%, corresponding to HNa2 LiAl (PO4)2(OH). The TGA curve shows 1% loss in wt. at 337-429°C, 5.2% at 429-472°C, and 0.6% 472-542°C. The DTA curve shows 3 small endothermic peaks at 452°C, 615°C, and 650°C (fusion). The IR spectrum is given. The mineral is dissolved by dilute HNO3 or HCl.

X-ray study shows tancoite to be orthorhombic, space group Cmcm, Cm2a, or Cm2a, a = 7.041, b = 14.130, c = 6.975 Å, Z = 4, D calc. 2.724, meas 2.752. The strongest X-ray lines (49 given) are 4.672(100), 3.413(90), 3.150(100), 0.414(220), 2.479(90), 2.029(320), 1.765(300), 1.760(400).

The mineral occurs as isolated crystals up to 1 mm long and as drus of columnar individuals. Forms found are (100), (010), and (111), dominant, (021), (001) minor. Goniometric data are given. Colorless to pale pink, luster vitreous. Cleavages [010], [001] fair, fracture conchooidal. H 4-4, Optically biaxial, neq., ng (Na) a = 1.541, β = 1.563, γ = 1.564, 2V = 23° (24° calc.), r < v weak, X = a, Y = b.

The mineral occurs in the Tanco spodumene-bearing pegmatite, associated with lithium phosphate and pink apatite and a hydrous sodium phosphate, Na3HPO4 · 2H2O. Type material is at the Royal Ontario Museum, Toronto; metatype specimens in the National Museum of Natural Sciences, the Smithsonian Institution, and the University of Manitoba, Winnipeg. M.F.

Stibivanite*


Yarrowite*, Spionkopite*


Microprobe analyses of yarrowite (8) gave (range and averages) Cu 65.3-71.7, 69.6, S 30.2-32.8, 31.4; Fe 0-0.5, 0.1; total 95.9-103.5; Cu:S = 1.06-1.17, 1.12, agreeing with previous analyses (Can. Mineral., 12, 95-103 (1973)). Analyses of spionkopite (6) gave (range and average) Cu 67.1-70.8, 68.9; S 25.8-27.2, 26.4; Cu:S 1.31-1.32, 1.32.

The Gandolfi X-ray pattern of yarrowite is indexed as hexagonal, space group P3m1, P31m, or P321, a = 3.800, c = 67.26Å, Z = 3 (Cu₉Se₈), D calc = 4.89. The strongest X-ray lines (44 given) are 3.061(55)(100), 2.767(35)(1.03), 1.899(100)(110). The X-ray pattern of spionkopite is indexed as hexagonal, space group P3m1, P31m, or P321, a = 22.962, c = 41.429Å, Z = 18 (Cu₃S₂S₈), D calc = 5.13. The strongest X-ray lines (42 given) are 3.076(85)(6.0.5), 2.777(30)(6.0.8), 2.297(25)(6.0.13), 1.910(100)(6.6.0), 1.820(30)(6.19).

The minerals were previously called “blaubleibend covellite” (blue-remaining covellite). Both are opaque, birefringent in blue (O) and bluish-white (E). Yarrowite is strongly anisotropic in orange-red, reflectances at 546 nm, O 15.5, E 20.6%. Microhardness 93-98 kg/sq.mm (15 g load). Spionkopite is anisotropic in orange, reflectances at 546 nm, O 12.1, E 20.6%. Microhardness 93-98 kg/sq.mm (15 g load).

The minerals occur in stratiform red-brown copper deposits in the Yarrow Creek and Spionkop Creek areas, S.W. Alberta. Associated minerals include chalcopyrite, bornite, anilite, djurleite, wittichenite, and tannite.

The names are for the localities. Type material is at the Geological Survey of Canada, Ottawa, and Queen’s University, Kingston, Ontario. M.F.

Unnamed iridium sulfides


Microprobe analyses [using metals and troilite (for S)] on two grains of the unnamed mineral (s) gave Ir 36.10, 51.40; Pt 17.10, 18.10; Rh 11.50, 25.20; Cu 11.0, n.d.; Os 0.10, 0.18; Fe 0.12, n.d.; Ni 0.10, n.d.; S 25.8-32.8, 31.4; sums 101.02 (100.92 given). The strongest X-ray lines (44 given) are 3.181(15)(6.0.3), 2.777(30)(6.0.8), 2.297(25)(6.0.13), 1.910(100)(6.6.0), 1.820(30)(6.19).

The sulfides occur as round to isometric inclusions (10-60 μm) in a matrix of Pt–Fe alloys grains (0.1-1.5 mm) in ore slimes collected from talus and alluvium within and below a zone of chloritic and quartzitic metamorphic rocks of the northern Kamchatka metamorphic block. The Pt-Fe grains are found associated with cuprian gold, gold, and other platinum-group minerals.

Discussion

The unnamed iridium sulfides of Begizov et al. (1975) have stoichiometries known in the synthetic systems: (Rh,Ir)₂S₃ and Ir₂S₅. The stoichiometry proposed by Zhdanov and Rudashevskii is unknown in the Ir–S system. L.J.C.

Unnamed Minerals


This report describes 33 minerals formed in 5 burning anthracite waste piles and 1 burning mine. They include the new mineral downeyite (SeO₂), 62, 316-320 (1977), and 5 unnamed minerals, identified by X-ray and microprobe analyses. They are (1) As₂Se₃, monoclinic, dark-red clusters of tabular crystals up to 3 mm long; (2) GeS₂, orth., white fibers on ottomanite; (3) KAlF₄, tetragonal, colorless lath-like crystals generally about 100 microns wide, some exceeding 1 mm in length; (4) KAl(SeO₄)₂, tetragonal, colorless laths and white branching rods; (5) (NH₄)₂Al(SO₄)₂, hexagonal, as an earthy white powder or yellowish-white to gray stalactitic masses up to 20 cm in length; (6) Al₂(SO₄)₃, hex., white earthy masses, n = 1.468. M.F.

Unnamed Minerals


Analysis (av. of 7) gave SiO₂ 38.09, As₂O₅ 2.11, V₂O₅ 7.44, MnO 49.94, FeO 0.31, CaO 1.30, sum 99.19% corresponding to (Mn₁.₇₋₁Ca₆₋₁SrFeO₃)₂(V₆S₅₋₁As₅₋₁Se₅₋₁O₇)₀.₈OH (X-ray study shows it to be monoclinic, P2₁/a, a = 6.71, b = 28.94, c = 7.57Å, β = 95.4°. The strongest X-ray lines (50 given) are 3.332(83)(122,042,210); 3.181(63)(180); 3.137(91)(112,171); 2.894(99)(190,250); 2.737(68)(241,191); 2.632(73)(202,162,172); 2.603(74)(207,212); 2.450(100)(280,092,033); 2.428(59)(103,113).

The mineral occurs at Molinello, Italy (compare tiragalloite, 65, 947-952 (1980)) as small brown grains in quartz veins with braunite. M.F.

Unnamed palladium bismuth chloride


Average of 3 separate microprobe analyses (using metals and synthetic chlorapatite) gave Pd 24.5, 2.07, Fe 0.78, Ni 0.07, Bi 64.1, Cl 6.43, sum 98.15 and a formula of (Pd₃₋₁Bi₃₋₁Cl₄₋₁)₀.₈⁺(Fe₂₋₁Ni₁₋₁)₀.₁₋₁ for an empirical formula of Pd₆Bi₂Cl₁₃. The mineral occurs as very small rounded to anhedral crystals, not larger than 30 x 30 μm in cross-section, in a matrix of insizwaite-geversite and paolovite. This occurrence is cited deposits of eastern Pennsylvania. Pa. Topogr. Geol. Survey, Mineral Resour. Rept. 78, 1-82.

This report describes 33 minerals formed in 5 burning anthracite waste piles and 1 burning mine. They include the new mineral downeyite (SeO₂), 62, 316-320 (1977), and 5 unnamed minerals, identified by X-ray and microprobe analyses. They are (1) As₂Se₃, monoclinic, dark-red clusters of tabular crystals up to 3 mm long; (2) GeS₂, orth., white fibers on ottomanite; (3) KAlF₄, tetragonal, colorless lath-like crystals generally about 100 microns wide, some exceeding 1 mm in length; (4) KAl(SeO₄)₂, tetragonal, colorless laths and white branching rods; (5) (NH₄)₂Al(SO₄)₂, hexagonal, as an earthy white powder or yellowish-white to gray stalactitic masses up to 20 cm in length; (6) Al₂(SO₄)₃, hex., white earthy masses, n = 1.468. M.F.
native silver electrum, and other platinum-group minerals. The unnamed mineral is strongly bireflectant, from dark gray to nearly white with a rose tint. It has an extremely fine fibrous structure and appears gray with a shagreen surface in sections perpendicular to the fibers. It has a relatively low reflectance which increases uniformly towards the red end of the spectrum. The mineral is strongly anisotropic, with color effects, from near extinction to yellowish, which are at maximum in oil immersion. The mineral qualitatively resembles a fine-grained aggregate of valleriite. One distinct, fracture-free micro-indentation gave VHNro: 114.

Discussion

A probable new mineral species requiring X-ray data for confirmation. The discovery is important as it is the first of a chloride-bearing platinum-group mineral. Also this is the first confirmation of insizwaiite in the Noril’sk-Talnakh area. L.J.C.

Unnamed Sulfate of Cu and Mn


Analysis (not given) gives the formula Mn(Cu, Zn)₄(SO₄)₂(OH)₆ ⋅ 4H₂O (microprobe analysis, H₂O calc. to fit unit cell). Monoclinic, C₂/m or Cm or C2, a = 21.707, b = 6.908, c = 11.245Å, β = 100.3°. The strongest X-ray lines (16 given) are 10.68(100)(200), 5.34(60)(400), 3.56(44)(400). Optically biaxial, neg., 2V = 51°, ns (Na) α = 1.589, β = 1.645, γ = 1.659, D calc. Gladstone-Dale 3.06. Color pale blue to greenish. M.F.

Unnamed Sulfides and Sulfosalts


Three probably new minerals occur in these ores. Mineral B, Ag₄TeS₆, occurs in association with arcubisite. Mineral C occurs in galena or intergrown with hessite, tellurian canfieldite, or freibergite. Three microprobe analyses gave Ag 64.8, 66.8, 61.7; Sb 11.9, 8.6, 7.1; Te 6.1, 12.4, 17.0; S 13.7, 9.7, 8.8; sum 96.5, 97.5, 94.6, suggesting the formula Ag₄Sb(S,Te)₆. In reflected light it is light bluish-gray with reflectance slightly higher than that of freibergite. Pleochroism weak in oil, not visible in air. Anisotropy distinct. Mineral D has developed from the alteration of aikinite. Microprobe analysis gave Ag ~ 15, Pb ~ 23, Cu ~ 5, B ~ 45, S ~ 17%, suggesting the formula (Ag,Cu)PbBi₂S₅. Color and reflectance similar to those of galena. Anisotropy distinct. M.F.

NEW DATA

Calderite


Microprobe analysis of garnet from Otjosundu, S.W. Africa, analyzed by Vermaas (1952) gave SiO₂ 35.16, TiO₂ 0.28, Al₂O₃ 9.04, Fe₂O₃ (total Fe) 16.27, MgO 0.50, CaO 12.12, MnO 27.38, sum 100.75%, confirming the analysis by Vermaas. It can be calculated to the end-members: calderite 51, grossular 36, spessartine 13. This analysis and those published by Klein (Jour. Petrol., 7, 249-305 (1966)) from Labrador confirm the validity of the garnet end-member calderite, Mn₃[Fe₂⁺³(SiO₄)]₃. M.F.

Jungite (correction)

The abstract in 65, 1067 (1980) gave the color incorrectly. It should be “bright yellow to greenish-yellow”. M.F.