NEW MINERAL NAMES∗

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Bogdanovite∗


Microprobe analyses are given of 11 samples, 4 iron-rich, 3 copper-rich, and 4 intermediate. Range of composition Au₅7.6–63.6, Ag1.67–3.39, Te9.60–10.3, Se0–0.28%, corresponding to the formula above. Cu and Fe vary reciprocally from Cu₃.36Fe₀.32 to Cu₀.75Fe₂.66.

X-ray data indicate a pseudocubic cell, derived from that of gold, with a = 4.087 Å. However, the optics show that the mineral is probably orthorhombic. The strongest lines (16 given) for iron-rich material are 2.36(10)(111), 2.045(6)(200), 1.447(6)(220), 1.230(8)(311).

Bogdanovite is rose-brown to bronze-brown with semi-metallic luster. It polishes well. Cleavage is absent. In polished section unusual colors such as reddish-brown, purple, and magenta are seen. Reflectances are given (Rg and Rp) at 15 wavelengths from 420 nm to 700 nm. For Cu-rich, 460 nm, 14.8, 9.2%; 540, 29.5, 5.6; 580, 37.6, 8.4, 660, 39.0, 36.2; for Fe-rich, 460, 13.8, 6.7; 540, 28.3, 2.5; 580, 36.4, 3.0; 660, 35.8, 29.9. The microhardness is much more affected by change of composition: for Cu-rich 290–354, av. 321 kg/sq. mm; for Fe-rich 290–354, av. 321 kg/sq. mm. Relief higher than for gold. The mineral occurs in cavities in magnetite ore, closely intergrown with (and possibly formed by the alteration of) chlorite by NaCl-rich solutions. Plate crystals up to several mm in size have the form of dipyramids. Colorless to greenish-brown, luster vitreous to pearly on the perfect basal cleavage. Soft. G = 2.12, H = 1–1.5; uniaxial neg., ω = 1.556, ε = 1.545. The DTA curve shows endothermic peaks at 270° and 460°C. Trigonal, a = 6.165, c = 46.760 Å. Color violet. Pleochroic, O colorless, E pale pink.

Discussion

An unnecessary name for chromian pyroaurite. M.F.

Chlormanasseite


Two analyses of the mineral, found in serpentinite, SW China, gave Fe₂O₃ 13.54, 12.79; Cr₂O₃ 6.94, 7.49; Al₂O₃ 2.21, 1.74; MgO 36.74, 35.62; FeO 0.1, 0.15; MnO 0.06, 0.01; CO₂ 6.45, 7.78; H₂O + 32.33, 32.30; H₂O– 2.38, 1.78; sum 100.75, 100.56%. For the second analysis, this gives Fe:Cr:Al = 1.05:0.63:0.22. G = 2.12, H = 1–1.5; uniaxial neg., ω = 1.556, ε = 1.545. The DTA curve shows endothermic peaks at 270° and 460°C. Trigonal, a = 0.615, c = 46.760 Å. Color violet. Pleochroic, O colorless, E pale pink.

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Garavellite∗


Garavellite was recognized in polished sections as small aggregates, up to 200 µm across, of anhedral crystals, usually in contact

* Mineral marked with asterisks have been approved before publication by the Commission on New Minerals and Mineral Names of the International Mineralogical Association.

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with tetrahedrite, Sb-rich bismuthinite, chalcopyrite, and siderite. Microprobe analysis led to the empirical formula Fe$_{0.60}$Cu$_{0.02}$Sb$_{1.11}$Bi$_{0.78}$As$_{0.01}$S$_4$ on the basis of S = 4, or ideally Fe$_{0.76}$Bi$_{0.24}$S$_4$. Garavellite is orthorhombic, $a = 11.439$, $b = 14.093$, $c = 3.754$ Å, $Z = 4$, $G$ (calc) = 5.64. Strongest lines in the X-ray powder pattern (39 tabulated and indexed) are 3.62(3$\theta$) (230, 011), 3.12(3$\theta$) (121), 2.98(3$\theta$) (240, 330), 2.89(3$\theta$) (221), 2.63(3$\theta$) (311, 231), 2.51(3$\theta$) (250, 141). In reflected light garavellite is gray with a brown-olive tint similar to siderite. Birefringence is distinct and anisotropism is strong, from yellowish-green to bluish-gray. Vickers hardness (50 g load) 212-222 kg/mm$^2$. The name is for Professor C. L. Garavelli. A.P.

Georgeite*


Georgeite forms thin coatings mostly associated with malachite and chalcanthite on partly weathered tremolite rock containing disseminated copper and iron sulfides. It is light blue with a pale blue streak and vitreous to earthy luster, soft, and $G = 2.55$, transparent to sub-opaque (aggregates), $n$ (NaD) = 1.593, isotropic. Georgeite is amorphous to X-rays and electron beam. Chemical analysis gave CuO 54.9, ZnO 0.4, Na$_2$O 2.7, CO$_2$ 20.8, H$_2$O 21.7, sum 100.5%. After deduction of all Na$_2$O and corresponding amounts of CuO, CO$_2$, and H$_2$O as chalcanthite (12.35 wt%), the atomic ratios correspond to (Cu$_{0.83}$Zn$_{0.17}$)(CO$_3$)$_2$(OH)$_{1.52}$·6.3H$_2$O, the ideal formula being Cu$_4$(CO$_3$)$_2$(OH)$_4$·6H$_2$O. The name is for George Herbert Payne, past Chief of the Mineral Division, Western Australian Government Chemical Laboratories. A.P.

Jixianite


Chemical analysis gave WO$_3$ 50.39, Fe$_2$O$_3$ 6.53, MgO 0.20, PbO 38.72, CuO 0.27, MoO$_3$ 0.01, H$_2$O+ 3.68, sum 100.51 wt%. After deduction of wulfenite, the analysis was recalculated on the basis of 7(O,OH) per formula, to (Pb$_{0.036}$Fe$_{0.092}$Cu$_{0.020}$)$_2$ = 1.116(W$_{0.395}$Fe$_{0.489}$Mg$_{0.079}$)$_2$ = 1.8183(O$_{4.556}$OH$_{2.453}$)$_2$, or simply, Pb(W,$\text{Fe}^{3+}$)(O,OH)$_7$. Electron microprobe analysis gave WO$_3$ 50.13, PbO 40.15. FeO (total Fe) 8.86. CuO 0.0X, sum 99.14 wt%. Z = 8, $G$ (meas) = 6.04, $G$ (calc) = 7.22 (from Gladstone-Dale Rule) = 7.42. Soluble in hot concentrated H$_2$PO$_4$, but not in HCl, HNO$_3$, HF, H$_2$SO$_4$ or aqua regia.

X-ray powder diffraction showed that the mineral has the pyrochlore structure, cubic, $Fd\bar{3}m$, $a = 10.3594$(6) Å. The strongest lines of the pattern (21 given) are 5.97(5)(111), 2.98(2)(1022), 2.58(5)(400), 1.833(8)(440), 1.562(7)(622), 1.189(5)(662), 1.159(5)(840), 0.9968(5)(660,10.22).

The mineral commonly occurs as microcrystalline, honeycomb, and crust-like aggregates. Grain size ranges from a few hundredth of a micron to over 10 microns. It rarely occurs as octahedral crystals approximately 160 microns in size. The mineral is red to brownish-red with strong resinous luster and yellow streak. It is transparent, void of cleavage, and weakly magnetic with a specific susceptibility of $7.072 \times 10^{-4}$ mm$^3$/g. $H = 3 \pm$. Under the polarizing microscope the mineral is yellowish brown or greenish yellow, isotropic with $n = 2.262-2.315$. Some grains show weak birefringence.

Jixianite was found as a secondary mineral, closely associated with bismuthite and stolzite in the oxidized zone of hypothermal to mesothermal tungsten-bearing quartz veins located near the southern boundary of the inner contact zone of the Pan-shan porphyritic quartz monzonite stock, in Jixian (Ji County), Hebei, China. The primary minerals in the oxidized zone are quartz, wolframite, cassiterite, pyrite, chalcopyrite, and minor scheelite, wulfenite, native silver, and native copper. Other secondary minerals are sericite, goethite, and malachite. The name is for the locality. The type specimen is preserved in the Geological Museum, State Bureau of Geology.

Discussion (D. D. H.)

The data suggest that jixianite belongs to the pyrochlore structural type, although it is not a member of the pyrochlore group as defined by Hogarth (Am. Mineral., 62, 403-410, 1977). All X-ray lines with the exception of the weak line at 1.722Å are pyrochlore-type lines. This exception, said to represent the planes 600 and 442, does not belong to the pyrochlore structure and may be incorrectly indexed or belong to an impurity. All spacings appear to have been calculated using FeK$_a$ wavelengths, regardless of whether they belong to $\alpha$ or $\beta$ spectra. The number of significant figures in the formula, unit cell, and specific gravity (Gladstone-Dale) calculations is, in each case, unjustified. The pyrochlore structure implies complete disorder amongst the A ions and vacant A positions; the formulae are conventionally calculated with respect to B ions. The formula of jixianite can therefore be given as: (Pb$_{0.14}$Fe$_{0.07}$Cu$_{0.02}$)$_{1.23}$(W$_{0.57}$Fe$_{0.43}$)$_{0.8}$O$_{1.0}$H$_{0.72}$·2H$_2$O.

The data suggest the mineral to be a new species. Further single-crystal work is necessary to confirm the structural type. The density calculated from the empirical formula in the above discussion is 7.89 g/cm$^3$, much greater than the measured density of 6.04 g/cm$^3$. Assuming the analysis and the cell dimension to be accurate, a pore space of 30% in the mineral specimen used for density measurement would be required to account for the unusually large discrepancy. G.Y.C.

Keckite*


Microprobe analysis (standards Mg, Mn, Fe, and Zn metals andapatite) gave P$_2$O$_5$ 35.75, Fe$_2$O$_3$ 30.02, MnO 14.85, ZnO 2.24, CaO 5.88, MgO 0.66, H$_2$O (by diff.) 10.60%, corresponding to (Ca$_{0.63}$Mg$_{0.18}$)(Mn$_{1.66}$Zn$_{0.22}$)Fe$^{3+}_{1.3}$OH$_{2.65}$(PO$_4$)$_{2.4}$·2.03H$_2$O. Infrared study showed the presence of hydroxyl.

X-ray study showed keckite to be monoclinic, space group $P2_1/c$, $a = 15.02, b = 7.19, c = 19.74A, \beta = 110°30', Z = 2, G$ (calc) = 2.682, (meas) 2.6. The strongest lines (16 given) are 9.3(8)(002), 4.98(5)(212), 3.51(5)(400,021), 2.86(10)(402,411,116), 2.59(4)(422,117). The structure is related to that of jahnite.

Color brown, yellow-brown, dirty grayish-brown; luster dull. Cleavages {001}, {100}. $H = 4$. Optically biaxial, neg., $\beta = 1.692,


\( \gamma = 1.699, 2V \) not determinable because the crystals were inhomogeneous and showed undulatory extinction. Pleochroic, with X reddish-brown, Y yellow, Z yellow brighter than Y; absorption X \( \gg \) Y > Z. Z = b, XAc = 15-22°.

The mineral occurs in aggregates of crystals up to 2 mm long, formed by the weathering of phosphophyllite or rockbridgeite in the Hagendorn pegmatite, Bavaria, W. Germany. The name is for Erich Keck, collector of Hagedorn minerals. M.F.

\textbf{Kleemanite*}


Kleemanite occurs as an ochre-like coating and thin veins 1-2 mm thick on manganiferous iron ore in one section of the iron ore deposit at Iron Knob, South Australia. Chemical analysis gave ZnO 20.7, Al₂O₃ 24.4, P₂O₅ 35.7, Fe₂O₃ 1.1, MnO₂ 1.3, H₂O 18.2, sum 101.4%. (Fe and Mn calculated as FeO and Mn₂O₃; total calculated from weight loss on TGA curve), leading to the ideal formula ZnAl₂(PO₄)₂(OH)₂·3H₂O. Kleemanite is monoclinic, with a primitive lattice, \( a = 5.310(10) \), \( b = 17.13, c = 9.762(9) \), \( \beta = 110.20(4)° \), \( Z = 2 \); G (calc) = 6.07. The strongest X-ray lines (69 given) are 4.654(8)(310), 3.793(6)(120,III), 3.348(8)(012), 3.111(3)(210), 2.172(25)(202). Diffractometry of 2 crystals gave Zn₂O₂.₇, Al₂O₃₂₄.₄, P₂O₅₃₅.₇, Fe₂O₃₁.₁, Mn₂O₃₁.₃, H₂O₁₈.₂, sum 101.₄% (Fe and Mn calculated as FeO and Mn₂O₃; total calculated from weight loss on TGA curve), leading to the ideal formula ZnAl₂(PO₄)₂(OH)₂·3H₂O. Kleemanite is monoclinic, with a primitive lattice, \( a = 5.310(10) \), \( b = 17.13, c = 9.762(9) \), \( \beta = 110.20(4)° \), \( Z = 2 \); G (calc) = 6.07. The strongest X-ray lines (69 given) are 4.654(8)(310), 3.793(6)(120,III), 3.348(8)(012), 3.111(3)(210), 2.172(25)(202). Due to the small size of the fibers or crystallites only partial information on optical properties is reported: colorless in transmitted light, inclined extinction up to 40°, \( a = 1.598(2) \), \( \gamma = 1.614(2) \). The name is for Dr. Alfred William Kleeman of the University of Adelaide. A.P.

\textbf{Montdorite}


Analysis by electron microprobe (Li by ion microprobe) (av. of 25 grains) gave SiO₂ 47.31, TiO₂ 2.44, Al₂O₃ 4.96, MgO 4.30, FeO 17.13, MnO 9.89, K₂O 8.89, Na₂O 1.02, F 4.40, H₂O (by difference) 1.53, sum 101.87. The infrared absorption spectrum is given. M.F. Rajite ocurs as small (1.5 mm) crystals with mackayite in rhyolite at Lone Pine, New Mexico, and may be a pseudomorph after teineite. Analysis gave CuO 18.05, CaO 1.06, TeO₂ 80.96, sum 100.07%; average on 3 samples with total weight 309.1 g, after correcting for rem. This gives CuTe₂O₄, identical with the artificial compound prepared by Moret al. (1969). Rajite is easily soluble in dilute acids and fuses readily.

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\textbf{Rajite*}


The mineral first described by Rost (1937) (Dana's System of Mineralogy, 7th ed., v. 2, p. 601) as "lapparentite" and later described as khademite is renamed rostite. X-ray data for the new mineral gave a = 11.169, b = 13.039, c = 10.871A. The infrared absorption spectrum is given. M.F.

\textbf{Sabatierite*}

NEW MINERAL NAMES

Five electron microprobe analysis by J. Breton and C. Gille gave Cu 42.33–43.35, Ti 22.25–22.78, Se 34.27–34.75%, corresponding closely to Cu8Te5Se12. X-ray powder data are given; the strongest of 17 lines are 3.987(5)(100), 3.089(10)(102), 2.706(7)(021), 2.525(5)(103), 2.445(6)(004), 1.991(7)(200), 1.847(6)(202), 1.673(5)(124,131). The indexing is on an orthorhombic cell with a = 3.986, b = 5.624, c = 9.778A, Z = 1; G (calc) = 6.78.

In reflected light bluish-gray, strongly anisotropic with color effects from gray-blue to yellow-brown. Reflectivities (max. and min.) are given at 15 wavelengths from 420 to 700nm, 460, 33.8, 29.7, 26.1.

The mineral, extremely rare, occurs in radiating aggregates replacing crookesite included in berzelianite, in calcite veins in the Bukov deposit, Moravia, Czechoslovakia. The name is for German Sabatier, director of research, C.N.R.S. Type material is at the Ecole Superieure des Mines, Paris. M.F.

Sidorenkite*


The mineral had previously been referred to as “unnamed Na-Mn carbonate” (Am. Mineral., 49, 1154, 1964). Analysis by M.E.K. gave P2O5 27.57, MnO 22.40, FeO 0.49, MgO none, CaO 2.20, Na2O 32.36, K2O 0.44, CO2 15.71, sum 99.37%, corresponding to (Na2.91(K0.13)(Mn0.89Ca0.11Fe0.02)PO4)CO3 or Na3Mn(NO3)CO3. The analogous angle of bradleyite. The DTA curve showed a sharp endothermic break at 720°C (disassociation of carbonate); in nitrogen the break was at 790–830°C and had two stages. The infrared spectrum is given.

X-ray study showed the mineral to be monoclinic, pseudo-orthorhombic, space group C2h P21/m or C2 P21/a, a = 8.979 ± 0.001, b = 6.729 ± 0.001, c = 5.150 ± 0.002, β = 90°06’ ± 02’, Z = 2, G (calc) = 2.98, (meas) = 2.90. The strongest lines (36 given) are 8.97(20)(100), 3.36(100)(201,202), 2.99(12)(300), 2.69(15)(121,212,220), 2.243(12)(400), 1.682(20)(040).

Color pale rose, luster vitreous to pearly on cleavages. Cleavages [100] and [010] perfect, [001] imperfect; fracture stepped; H ~ 2, brittle. Strongly electromagnetic. Optically biaxial neg., α = 1.521, β = 1.563, γ = 1.585 (±0.002), 2V = 68° (meas), 70° (calc).

The mineral occurs in irregular grains and in crystals of matchbox shape, up to 2 cm, in pegmatites cutting cancrinite syenites of the Mt. Alluvia region, Lovozero massif, Kola Peninsula, USSR. It is associated with K-feldspar, nepheline, sodalite, cancrinite, and is cut by aegirine.

The name is for the Soviet geologist Alexander V. Sidorenko, President of the All-Union Mineralogical Society. M.F.

Unnamed BaCa(CO3)2


An unnamed mineral of this composition was mentioned by Gittins et al., Can. Mineral., 12, 211–214, 1973. Microprobe analysis gave CaO 18.4, ZrO2 40.3, SiO2 40.8, sum 99.5%. X-ray data, indexed by analogy with thortveitite, gave a monoclinic cell, space group probably C2/m, a = 6.869, b = 8.667, c = 4.681A, β = 101.82°, Z = 2; G (calc) = 3.645. The strongest lines (36 given) are 5.31(6)(110), 3.225(8)(111), 3.15(10)(021), 3.023(7)(201), 2.655(7)(220,130), 2.221(5)(136). M.F.

Unnamed tellurides


Veins contain scheelite, wolframite, tetradynite, tellurobismuthite, csilovite, rucklidgeite, hessite, and the following new minerals:

(1) Bi2Te4. Probe analysis from Ryczowa gave Bi 50.6, Cu 0.1, Fe 0.1, Te 43.0, sum 93.8%. Strongly anisotropic. Reflectance 438 nm, 51; 487, 60; 535, 62, 591, 63, 658, 63%. H = 24–28 kg/sq mm (20 g load). The X-ray lines are 3.15(10), 2.35(9), 2.16(7), 2.01(6), 1.798(6), 1.598(6), 1.484(7), 1.410(6), 1.389(6), 1.072(6).

(2) Bi2Te3. Probe analysis gave Bi 50.0, Te 51.0, sum 101.0%. Isotropic. Reflectance 438–686 nm, 60–63%. H 25–30 kg/sq mm (20 g load).

(3) Bi2Te5S2. Probe analysis gave Bi 68.8, Te 22.0, S 6.0, sum 96.8%. Anisotropic. Reflectance at 591 nm 55%. H 34 kg/sq mm (20 g load).

(4) Bi2Te5S2. Probe analysis gave Bi 63.1, Cu 0.2, Te 27.5, S 7.9, sum 98.7%. Anisotropic. Reflectance at 591 nm = 53%. H 32 kg/sq mm.

(5) AgTe. Probe analyses gave Ag 75.3, Te 25.0, sum 100.3%. Ag 69, Cu 0.2, Fe 0.1, Bi 2.4, Te 25.8, S 0.1, sum 97.6%. Reflect-
ance 438 nm, 24; 487, 26; 535, 29; 591, 32; 658, 32. Anisotropic.

(6) (Ag, Cu, Bi)₆Te₂S. Probe analysis gave Ag 52.7, Cu 5.3, Bi 8.5, Te 28.5, S 3.9, sum 98.9%. Anisotropic. Reflectance at 591 nm 40%. H 18 kg/sq mm. Anisotropic.

(7) (Ag, Cu, Bi)₆Te₂S. Probe analysis gave Ag 39.0, Cu 5.8, Bi 19.1, Te 28.4, S 6.6, sum 99.0%. Anisotropic. Reflectance at 591 nm 43%. H = 20-23 kg/sq mm. M.F.

Unidentified palladium arsenide

Elvira Gasparrini (1975) Mertieite and an unnamed compound of palladium with arsenic and tin in a mineral intergrowth from the Atok Mine. National Institute for Metallurgy Report No. 1726. Electron microprobe analysis gave Pd 71.8, Pt 2.5, As 19.9, Sn 5.0, Sb 0.4, sum 99.6% corresponding to (Pd₂.1₇₄Pt₀.0₄₂)(As₀.₅₃₃S₀.₁₄₅Sb₀.₀₁₀), assuming As + Sn + Sb = 1 atom. Distinctly anisotropic, slightly bireflectant, grayish-yellow under reflected light. Single occurrence from Atok mine in a 50-micron intergrowth with a mineral reported as mertieite, from which it could only be distinguished because of different orientation. Reflectances (percent) for R’ max and R’ min 436 nm 48.52 and 46.82, 480 nm 53.0 and 49.8, 527 nm 56.85 and 54.26, 546 nm 56.16 and 54.42, 589 nm 58.76 and 56.51 nm, 622 nm 57.89 and 56.41, 656 nm 58.99 and 57.11. VHN₁₀ = 532.7 and VHN₂₅ = 585. A 16-reflection powder pattern representing the mineral intergrowth is reported and indexed on a pseudo-hexagonal cell (a = 15.038, c = 22.48Å) attributed to "mertieite." Nine of these reflections are also re-indexed on another pseudo-hexagonal cell (a = 8.68, c = 17.06Å) which is attributed to the unidentified mineral. L.J.C.

Palladium arsenostannide


Electron microprobe analyses of four grains from the Norilsk mining area gave Pd 61.5, 61.8, 57.1, 64.2; Ag 2.3, 2.2, 3.0; Fe 0.2, --, ---; Au 0.3, --; 3.3; Pt 2.0, 3.1; Sn 24.6, 29.7, 32.0, 19.2; As 7.2, 5.7, 3.1, 6.1; Sb 2.3, 2.0, 2.2, --; P 0.3, --, 0.4, --; Bi 0.1, --; sums 98.4, 99.6, 97.0, 98.9, with suggested idealized formulas of (Pd,Ag)₂₋₋(Sn,As,Sb), Pd₅₋₋(Sn,As,Sb)₃, (Pd,Ag)₅₋₋(Sn,As,Sb)₃ and (Pd,Ag)₅₋₋(Sn,As). The authors described the first three compositions separately from the fourth in parts of the text, but in other parts these are not distinguished from each other. Both groups are referred to as palladium arsenostannide but the first three are also called antimonian palladium arsenostannide.

The mineral is described as distinctly anisotropic, with colors usually from gray to light yellow-greys. It is light gray with a yellowish tint, with an occasional pinkish hue, and weakly bireflectant under reflected light. The mineral occurs in several size ranges: 1-10, 2-10, 25-60, and 40-200 microns. Reflectances are given for four grains, for analysis No. 2, above for R’ max and R’ min (in percent) 460 nm 48.6 and 44.6, 520 nm 53.0 and 49.8, 580 nm 56.1 and 52.0, 640 nm 58.4 and 55.3, 700 nm 60.5 and 56.1. 0003-004X/79/1112-1333$00.50

A 14-reflection powder pattern of the mineral was indexed on a pseudo-hexagonal cell with a = 8.68, c = 17.07Å. The Pd₅₋₋(Sn,As,Sb)₃ mineral is considered to represent "a solid solution of the compounds Pd₅₋₋+Pd₅₋₋Sb₂ (or Pd₅₋₋Sb₃) in Pd₅₋₋Sn₂."

Discussion

The data presented are not sufficiently unambiguous to characterize any single new mineral. The unfortunate practice of using names derived from elements determined, without regard to the essential nature of all elements, is deplored. This has been a "technique" used to obtain publication in certain journals without seeking approval of the New Minerals and Mineral Names Commission, IMA. L.J.C.

New Data

Bohdanowiczite


Bohdanowiczite, first reported in 1967 (Am. Mineral., 53; 2103; 55, 2135), has been reexamined by microprobe and X-ray powder diffraction and has now been accepted by the IMA Commission on New Minerals and Mineral Names. The average of three microprobe analyses gave Pb 1.34, Bi 44.39, Ag 22.31, Cu 0.25 Co 0.01, Ni 0.02, S 2.47, Se 28.46, sum 99.75%, corresponding to AgBiS₄ with minor substitution of Cu for Ag, Pb for Bi, and S for Se. Cell parameters for the hexagonal lattice are a = 4.183(8) and c = 19.561(16)Å, and the most likely space group is considered to be P3m1. Strongest lines of the powder pattern (24 tabulated) are 6.54(20)(0003), 3.40(20)(1012), 3.26(18)(0006), 2.91(100)(1014), 2.09(18)(1120), and 2.03(30)(1122, 1018). The calculated G is 7.72, Vickers hardness between 63 and 96 kg/mm². The color is creamy yellow and bireflectance can be observed only along grain margins under oil immersion. The name is for the late Professor Karol Bohdanowicz of Cracow. A.P.

Graphite


A new analysis of non-metamict graphite from Alberes, east Pyrenees, gives the formula as M_{24}Ca_{4}Fe_{3}^{2+}Al_{10.13} \square_{0.17}^{4} \square_{0.17}^{4} (Al_{0.96}Fe_{1.04}^{3+})_{0.15} \square_{0.17}^{4} (Fe_{3}^{2+}Fe_{1.05}^{3+})_{0.15} (PO_{4})_{0.15} (F,OH)_{0.15} where M = Li_{0.08}Na_{0.13}Mg_{0.24}Ca_{0.6}Mn_{0.48}Fe_{3}^{2+}Fe_{1.05}^{3+}. Cubic, space group Pa₃, a = 12.205Å, G(calc) = 3.65, (meas) = 3.64. M.F.

Todorokite


Electron diffraction patterns of todorokite show that besides the Cuban todorokite from Oriente Province with cell parameters...
NEW MINERAL NAMES, ERRATA

a = 9.75, b = 2.84, c = 9.59Å (Am. Mineral., 45, 1174, 1961), there also occur varieties with \( a = 14.6A \) (i.e., \( 4.88 \times 3 \)) and \( b = 24.38A \) (i.e., \( 4.88 \times 5 \)), having the same \( b \) and \( c \) values. Trilling inter-growth of elongated crystallites resembling Sagenitic rutile were observed by electron microscopy for todorokites from an iron-manganese concretion from the Pacific Ocean \((a = 14.6A)\) and from the Bakal deposit \((a = 24.4A)\). Todorokites with \( a = 25A \) were found in samples from Sterling Hill and the Takhte-Karacha deposit. It is suggested that varieties with \( a = 14.6A \) (i.e., \( 4.88 \times 3 \)) and \( a = 24.4A \) (i.e., \( 4.88 \times 5 \)) might also exist. The following nomenclature is recommended for the todorokite polymorphs:

- todorokite I, \( a = 4.88A \)
- todorokite II, \( a = 4.88 \times 2 \)
- todorokite III, \( a = 4.88 \times 3 \)
- todorokite IV, \( a = 4.88 \times 4 \)
- todorokite V, \( a = 4.88 \times 5 \)

R.G.B.

Vernadite


Vernadite was originally named for the X-ray amorphous to slightly crystalline \( MnO_2 \cdot xH_2O \) phase formed by supergene alteration of rhodonite (Am. Mineral., 31, 85, 1946). It is now proposed that the name vernadite take precedence over delta-MnO_2 (term for a specific synthesis product) for poorly crystalline supergene hydrated manganese(IV) oxides giving reflections at 2.4 and 1.4A in X-ray powder and electron diffraction patterns. The composition of vernadite is variable: \( MnO_2 \cdot m(R_2O, RO, R_2O_3) \cdot nH_2O \), where \( R = Na, Ca, Co, Mn, Fe \). It is distinguished from less abundant birnessite by the absence of diffractions at 7.0–7.2 and 3.5–3.6A. In electron microscope preparations leaflets of vernadite have smaller dimensions (tens of angstroms) than flakes of birnessite, and vernadite leaflets are often curved and folded to resemble fibers. Electron diffraction patterns suggest vernadite is hexagonal \( a = 2.86, c = 4.7A, \) and structurally similar to feroxyhyte (8'-FeOOH). In addition to its occurrence as a weathering product of Mn^2+-containing oxides, carbonates, and silicates, vernadite occurs in marine and freshwater iron–manganese crusts and concretions, often in relict bacterial forms. It also forms as an oxidation product of todorokite, which it replaces pseudomorphously. R.G.B.

Discredited Minerals

Droogmansite = Kasolite


Droogmansite was described in 1925 (Am. Mineral., 11, 168, 1926) as a uranium mineral from Kasolo, Belgian Congo (now Zaire). A sample, probably the original, or at least a metatype, has been re-examined by X-ray and found to be kasolite. M.F.

Frigidite = Tetrahedrite and Ni-bearing minerals


Frigidite from the type locality, formerly regarded as a nickelian tetrahedrite [Dana's System of Mineralogy, 7th ed., vol. I, p. 377 (anal. 27), 379, 1944], has been examined by microprobe and no Ni found. However, this tetrahedrite is associated with the nickel sulfides ullmanite, vaesite and pentlandite, not hitherto reported from this locality. A.P.

Schuchardtite = nickel-bearing interlayered vermiculite–chlorite


Analyses (NiO 0.20–24.12%), DTA and X-ray data of samples from the type locality show that they are mixtures of vermiculite-like and chlorite-like materials, mostly irregularly interstratified. The name should be dropped. M.F.

ERRATA


The following corrections should be noted on page 854. In equation 7: instead of \((\sin 8)/\pi\), read \((\sin 8)^2)/\pi\). In equation 8 the scattering factor \( f_j \) should not be factored; it should be placed under each \( \Sigma \) sign.

Error problems in the two-media method of deriving the optical constants \( n \) and \( k \) from measured reflectances by Peter G. Embrey and Alan J. Criddle (Vol. 63, 853–862).

Fig. 2, page 855, should have the abscissa labeled “Refractive Index \( n \)”. Equation 7b, page 860, should read

\[
a = \frac{h}{2N^2} (N^2 + 1) + \frac{1}{2N^2} (N^2 - 1) \sqrt{(h^2 - N^2)}
\]


The suggested formula in the Discussion should read \( Pb_2(Fe^{2+},Zn)(AsO_4)_2 \cdot H_2O \).

The crystal structure of baratovite by Silvio Menchetti and Cesare Sabelli (Vol. 64, 383–389).

The formula for baratovite in Table 1 (page 384) should read \( KLi_3Ca_7(TiO_1.87ZrO_0.13)_{18}S_{18}O_18F_2 \).

Chemistry and physical properties of axinites by Gregory R. Lumpkin and Paul H. Ribbe (Vol. 64, 635–645).

No less than three spelling errors have come to our attention. Severiginite and manganeseeverginitae are the proper renderings of the names given by Kurshakov to manganaxinite and tinzenite (p. 636). With apologies to the gentlemen in question, we report two misspelled names: Chaudhry (for Chaudry—pp. 636, 640, 645) and Plyusnina (for Plyusina—pp. 637 and 645).