NEWMINERALNAMES*

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Abhurite*


Chemical analysis gave Sn 73.4, Cl 15.7, O 11.0, H 0.4, sum 100.5 wt%; the ideal formula Sn₃O(OH)₂Cl requires Sn 74.6, Cl 114.9, O 11.0, H 0.4 wt%. The mineral occurs as cryptocrystalline crusts and as platy hexagonal crystals that average 1.5 mm in diameter. Colorless, transparent with opalescent luster, white streak, hackly fracture, H = 2, dissolves slowly in HCl and HNO₃, D_{max} = 4.29 (pycnometer). D_{calc} = 4.35 g/cm³ with Z = 21. Crystals are platy to tabular on hexagonal (0001), twinned on (0001), and have rhombohedral forms (0115) and (0001). Optically uniaxial positive, ω = 2.06, ε = ~2.11. Single-crystal X-ray study indicated rhombohedral symmetry, space group R̄3m, R̄3̅3, or R̄3̅2; the refined Guinier-Hagg powder pattern (CuKα) gave hexagonal parameters a = 10.0175(3), c = 44.014(2) Å, and strongest lines of 4.139(50)(116), 3.404(50)(208), 3.271(35)(211), 3.244(35)(122), 3.142(35)(214), 2.9074(35)(217), 2.8915(70)(300), 2.8175(50)(128), 2.5313(100)(11.15), and 1.8928(35)(410).

Abhurite occurs as blisterlike protuberances that formed as a corrosion product of tin ingots recovered from the cargo of a sunken ship, wrecked possibly 100 yr ago, lying in a Red Sea cove known as Sharm Abhur, about 30 km north of Jiddah, Saudi Arabia. Associated minerals are romarchite, kutnohorite, and aragonite. Specimens of abhurite are in the Smithsonian Institution, Washington, D.C., and in the Royal Ontario Museum, Toronto, Ontario. J.L.J.

Bazhenovite*


Wet-chemical analysis combined with TG results (water) and corrected for impurities (Fe) gave Ca 27.58, sulfide S (S') 6.11, polysulfide S (S') 7.25, thiosulfate S (S') 6.20, H₂O (hydroxyl) 9.46, H₂O (molecular) 31.20, O 12.20, total 100.00 wt%, corresponding to Ca(S₂S₆S₄S₄)₂²⁺Ca₃(S₂₅O₆0₄)₂·3Ca₆0₆(OH)₁₂·₂O·20.14H₂O. The mineral forms aggregates up to 1 cm in diameter, orange to yellow, light yellow streak, vitreous luster; intergrowths of parallel plates have a pearly luster. Crystals are blades up to 5 mm long, flattened on {010}, elongate [001], with {110} edges and terminated by {011}, {101}, and {111}. Thin crystals are transparent, and coarser grains are transparent to translucent. Fracture uneven, very good {010} cleavage, brittle but elastic in thin leaves, H = 2, D_{max} = 1.83(1), D_{calc} = 1.845 g/cm³ with Z = 1. No luminescence in ultraviolet light (360 nm). Decomposes in water, giving S and a white porous residuum; decomposes in HCl to give S and H₂S. Slowly hydrolyzes in air, gradually becoming colorless with a weak bluish tint, preserving the transparency. Hydrolyzed pseudomorphs typically have porous aggregates of S on their surfaces. The DTA curve shows a strong endothermal effect at 140 °C (loss of molecular water, 31.7 wt%), a distinct exothermic one at 365 °C (loss of sulfide and polysulfide sulfur, 13.4 wt%), and an endothermal one at 495 °C (loss of hydroxyl water, 16.2 wt%). Additional weight loss at higher temperatures is 4.8%. The infrared spectrum shows absorption bands at 810 (H₂O), 1100 (SO and S₂O₃), 1630 (H₂O), and 3300 (OH) cm⁻¹. Optically biaxial positive, α = 1.595(2), β = 1.619(2), γ = 1.697(3) (white light), a = Y, b = X, c = Z > 30°, 2V_{calc} = 60° 20'. Strong pleochroism: X deep green-yellow, Y greenish-yellow, Z pale greenish-yellow, X > Z > Y. Single-crystal X-ray study shows the mineral to be monoclinic, space group P2₁/c, a = 8.45(1), b = 17.47(1), c = 8.24(1), β = 119.5°. Strongest lines of the powder pattern (57.3-mm camera) are 8.76(100)(020), 4.39 (100)(040), 2.91(60)(060), 2.81(50)(240), 2.62(50)(122), 2.28(50)(260), and 1.996(70)(162). The X-ray pattern of the mineral is similar to that of its synthetic orthorhombic analogue. The crystal structure of the mineral is layered, with Ca(OH)₂, polysulfide, and water-bearing layers parallel to (010).

Bazhenovite is associated with native iron, native sulfur, oldhamite, troilite, pyrrhotite, fluorite, and periclase in altered pyritized siderite fragments in the melted products of old, burning coal dumps of the Chelyabinsk coal basin, south Ural Mountains, USSR. The name is for A. G. Bazhenov (petrographer) and L. F. Bazhenova (analytical chemist). Type material is in the Fersman Mineralogical Museum, Moscow. J.P.

* Prior to publication, minerals marked with an asterisk were approved by the Commission on New Minerals and Mineral Names, International Mineralogical Association.
CespIumtantite*  
A. V. Voloshin, Ya. A. Pakhomovskii, A. Yu. Bakhchisaraitsev, N. N. Devnina (1986) Cesplumtantite - A new cesium-lead tantalate from granitic pegmatites. Mineral Zhurnal 8(5), 92-98 (in Russian). Microprobe analysis (3 given) gave Ta2O5 63.85, Nb2O5 3.24, Cs2O 5.37, Na2O 0.71, CaO 0.83, PbO 20.24, Sb2O5 2.88, SnO2 (calculated) 1.60, sum 100.21 wt%, corresponding to (Cs0.93Na0.95)Sn0.35Ta2O7 (Tao5.10Sbb0.35)Ta2O7.8 (Cs0.93Na0.95)Sn0.35Ta2O7.8 with Cs > Na, Pb > Sb. X-ray powder study shows the mineral to be tetragonal, \( a = 13.552(8), c = 6.445(5) \text{Å} \), \( Z = 2 \). The strongest X-ray lines (35 given) are 6.11(50)(210), 3.19(50)(330), 3.054(100)(112), 2.037(50)(621), 1.869(70)(323), 1.593(70)(821), and 1.181(50)(654). The mineral is colorless, transparent, whitestreak, adamantine luster. No cleavage observed. Micro-hardness 1240 kg/mm² (40 g load). Dealers = 6.87(5) g/cm³. Light gray in reflected light, weak bireflectance, no pleochroism or internal reflection. Strongly anisotropic, with complex polynthetic twinning. Reflectance values (nm, %) in air (Si standard) are 476, 18.2, 17.1; 553, 17.3, 16.5; 589, 17.1, 16.5; 656, 15.6, 15.3.

CespIumtantite was found in a museum specimen of thoraeulite in granitic pegmatite from Manono, Zaire. The new mineral occurs as veinlets of elongate aggregates up to 0.3 mm long and is associated with lithiopontite, cassiterite, calciotantite, and microlite. The name alludes to the chemical composition. The type specimen is at the Museum of the Leningrad Mining Institute, Leningrad, USSR. J.P.

Cobaltaustinite*  

Electron-microprobe analysis gave CaO 22.4, CoO 25.8, CuO 2.5, As2O5 46.1, P2O5 0.3, SO3 0.3, H2O (CHN analysis) 3.6, sum 101.1 wt%, corresponding to Ca1.01Co1.01Cu0.99As1.01P1.01O10.01(OH)1.01, simplified as Ca(Co,Cu)(As,P,S)O(OH) and ideally CaCoAs2O4(OH). Additional microprobe analyses show substantial Co-Cu variations, suggesting complete solid solution with conichalcite, the Cu end-member. The mineral occurs as dull green coatings of crystallites up to 25 μm in diameter. Streak pale green, brittle, conchooidal fracture, H = 4½, soluble in HCl and HNO3. \( D_{calc} = 4.24 \text{g/cm}³ \) for the analytical formula and \( Z = 4 \). Optically biaxial positive, \( a' = 1.777(3), \Phi = 1.802(3), \) large 2V, greenish-yellow and not pleochroic. Cell dimensions calculated from the X-ray powder pattern (114.6-mm Debye-Scherrer camera, Cu radiation) indexed by comparison with nickelastaite are \( a = 9.75, b = 9.01, c = 6.92 \text{Å} \); strongest lines are 4.13(70)(111), 3.159(100)(201), 2.633(80)(112), 2.600(80)(221), 2.532(40)(131), and 1.609(100)(332).

Cobaltaustinite occurs with erythrite and numerous other arsenates derived by oxidation of arsenide-rich ore at the small Dome Rock copper deposit, which is about 42 km north of Mingary and on the Adelaide-Broken Hill railway about 470 km from Adelaide. The holotype specimen (M32479) is in the Museum of Victoria, Melbourne, Australia. J.L.J.

Ecadreswite*  

Four electron-microprobe analyses of the mineral from the type locality, the Melbourne Rockwell mine at Little Broken Hill (13 km southeast of the main Broken Hill deposit, New South Wales), gave TiO2 50.12-52.45, FeO 8.8-13.65, MnO 4.4-7.64, ZnO 28.5-35.05, total 98.85-100.0 wt%, corresponding to (Zn0.13-0.49Fe1.9-0.39Mn0.05-0.11)-Ti09.99-1.03O3 ideally ZnTi3O6, the Zn analogue of ilmenite. At the type locality the mineral occurs as euhedral tabular grains, up to 50 by 150 μm. Physical and optical properties are similar to those of ilmenite: dark brown to black color and streak, submetallic luster, \( V_{H} = 500-600 \) kg/mm², no cleavage or twinning, \( D_{calc} = 4.99 \text{g/cm}³ \) with \( Z = 6 \). In reflected light, grayish-white with a pinkish tinge, weak reflection pleochroism in air, strongly anisotropic from greenish-gray to dark brownish-gray. Reflectance values in air (Si standard) for \( R_1 \) and \( R_2 \) are 470, 19.2-19.9; 546, 19.0-19.7; 589, 18.9-19.6; 650, 18.7-19.2; 16.8-17.5. X-ray crystal-structure study indicated rhombohedral symmetry, space group \( R3 \), hexagonal cell dimensions \( a = 5.090(1), c = 14.036(2) \text{Å} \). Strongest lines of the powder pattern are 2.73-(100)(1014), 2.53(90)(1120), 2.23(60)(1123), 1.87(40)-(0224), and 1.71(70)(1126), in close agreement with data for synthetic ZnTi3O6 (PDF 26-1500).

At the type locality the mineral is disseminated in quartz-rich metasedimentary rocks of amphibolite-granulate facies and coexists with almandine-spessartine, ferroan garnite, and rutile. Associated amphibolites contain zinccian ilmenite. The new mineral was discovered almost 20 yr ago in flotation residues of oxidized ore from the North mine at Broken Hill. At the San Valentín mine, La Union district, Sierra de Cartegena, Spain, ecadreswite grains up to 50 μm across occur intergrown with zinccian ilmenite in primary oxide-sulfate-carbonate ores. The new name is for E. C. Andrews, New South Wales government geologist (1870-1948), who mapped the Broken Hill region. A single grain from the Melbourne Rockwell mine type locality is at the Museum of Victoria (M35700). Specimens from the San Valentín occurrence are in the collections of the Free University, Amsterdam, the Netherlands. J.L.J.

Fahleite*  

Electron-microprobe analyses of five different crystal aggregates gave CaO 3.8–4.3, MnO 0.4–0.6, ZnO 25.6–26.5, FeO, O 10.1–10.4, AsO 43.1–44.2, H 2O (by difference) 14.4–16.6 wt%, Co, Ni, Mg, and Si not detected; the mean of the analyses corresponds to Ca 1.1, Mn 0.1, 2Zn 0.5, Fe 0.1, As 0.1, 13.4H 2O, ideally Zn 0.1, CaFe 0.1, As 0.1, 14H 2O, considered to be the Zn analogue of smolianinovite. The mineral occurs as minute fibrous aggregates or spherules and as gray to bright green to straw-yellow bundles of fibrous crystals more than 1 cm long. The crystals are only a few micrometers thick, are very soft, sectile, flexible, have a silky or pearly luster, are readily soluble in cold acid, and have a perfect cleavage normal to the fibers. The infrared spectrum (not given) is reported to confirm the presence of H 2O. Optically biaxial positive, with parallel extinction, positive elongation, \( \alpha = 1.628(1), \beta = 1.631(1), \gamma = 1.656(1) \), 2 \( \theta \) = 39°, Z parallel to the fibers. The X-ray powder pattern contains only five diffuse lines, with \( d \) values and (intensities) as follows: 22(100), 11(100), 3.2(80), 2.9(50), and 1.65 Å (20); the data are in good agreement with the seven similarly diffuse lines reported for smolianinovite.

Fahleite is named for Rolfe Fahle of Munich, a mineral dealer who donated the holotype specimen. Type material is deposited in the Mineralogical Institute, Ruhr University at Bochum, Federal Republic of Germany.

Discussion. If fahleite is the Zn analogue of smolianinovite, then the latter requires redefinition of its formula. Fahleite has the ideal formula Zn 0.1, CaFe 0.1, As 0.1, 14H 2O, and smolianinovite would be Co 0.1, Fe 0.1, As 0.1, 14H 2O or Co 0.1, CaFe 0.1, As 0.1, 14H 2O. Cell dimensions of fahleite (calculated from the indices assigned to smolianinovite) are \( a = 6.60, b = 11.6, c = 22 \) Å. J.L.J.

Ferristrunzite*


Electron-microprobe analysis gave Fe 0.46,3, P 0.4, 28.2, and TGA–EGA gave H 2O 26.0, sum 100.6 wt%. Microchemical tests showed a strong reaction for Fe 2+ but no reaction for Fe 3+. The results are in good agreement with those reported for the same mineral by van Tassel (Bull. Soc. Belge Geol., 75, 38–48, 1966) and correspond to Fe 0.5, Fe 0.5, (PO 4) 0.5, H 0.5, (H 2O) 0.5, (OH) 0.5. The ideal formula is Fe 2+ Fe 3+, (PO 4) 0.5, (OH) 0.5, (H 2O) 0.5. That of strunzite is MnFe 2+ (PO 4) 0.5, (OH) 0.5, (H 2O) 0.5. The new name alludes to the composition and relation to strunzite.

Ferristrunzite occurs as light brownish-yellow matted aggregates; crystals are acicular [011], 2 to 30 \( \mu \)m long; composites are up to 0.5 mm long; and radiating crystals are up to 2.6 mm in diameter. Light yellow streak, brittle, good cleavage parallel to the X–Z optical plane, \( D_{\text{meas}} = 2.38–2.50 \) (susension), \( D_{\text{calc}} = 2.55 \) g/cm 3 with Z = 2. Optically biaxial positive, \( \alpha = 1.646(4), \beta = 1.678, \gamma = 1.757(5), 2 V' = 77(10)^{o} \), strong dispersion; pleochroism X = greenish-yellow, Y = not observed, Z = brownish-yellow, Z > X, Z ∝ ∝ ∝ ∝ 17° and Z approximately parallel to the elongation. X-ray single-crystal study indicated triclinic symmetry, pseudomonoclinic, space group P1 or P1, \( a = 10.01(2), b = 9.73(2), c = 7.334(8) \), \( \alpha = 90.52(12), \beta = 96.99(10), \gamma = 116.43(10)^{o} \), Twinned (110). Strongest lines of the powder pattern (114.6-mm Gandolfi camera, Fe radiation) are 8.87(80)(100), 5.34(100)(111), 4.48(20)(111, 200), 4.37(20)(020, 211), 4.20(30)(220), 3.44(30)(012), 3.38(30)(210), 3.26(40)(012), 3.196(20)(102, 320), and 3.022(20)(202).

Ferristrunzite is associated with chlorite, diadochite, allopone-evansite, minyulite, strengite, phosphosiderite, cacoxyenite, and beraunite that occur as secondary minerals in argillaceous and clastic sediments exposed in a canal near Blaton, Belgium. Type material is at the Smithsonian Institution, Washington, D.C. J.L.J.

Fluorellestadite*


Wet-chemical analysis of impure material gave SO 4, 20.75, SiO 2, 15.30, P 2O 5, 1.31, CO 2, 0.66, CaO 5.00, MnO 0.18, MgO 1.38, Al 2O 3, 1.84, Fe 2O 3, 0.11, Na 2O 0.33, K 2O 0.1, H 2O 0.03, F 3.60, sum 100.76. When corrected for impurities (MgO, Al 2O 3, 4% CaO, Fe 2O 3, Na 2O and H 2O), the analysis corresponds to (Ca 0.9, Mn 0.1, Al 0.01, (SO 4) 2.86, (SiO 4) 2.86, (PO 4) 0.02, (CO 3) 0.03, M 0.01), ideally CaSi 0.01, (SO 4), (SiO 4), F 2. The mineral occurs as blue to pale bluish-green needles, as hexagonal prismatic, poorly terminated crystals up to 3 mm long, and as fine-grained aggregates. Thin needles are colorless, crystals are transparent, and aggregates are translucent. Vitreous to greasy lustre, conchoidal fracture, no cleavage, white streak with a weak bluish tint, H = 4.5, \( D_{\text{meas}} = 3.03(1), D_{\text{calc}} = 3.090 \) g/cm 3 with Z = 1. No luminescence in ultraviolet light (360 nm). Soluble and weakly effervescent in HCl, leaving a silica residuum that retains the original form. DTA and TGA curves are featureless, and only 1 wt% loss occurs on heating to 1000 °C. Optically uniaxial negative, colorless, negative elongation, \( \epsilon = 1.632(2), \omega = 1.638(2) \) for white light. The X-ray powder pattern, indexed by analogy with ellestadite (space group P6 3/m) gave a = 9.485(2), c = 6.916(2) Å, and strongest lines of 2.84(100)(211), 2.80(60)(112), 2.74 (90)(300), 2.28(60)(310), 1.954(70)(222), 1.852(80)(213), 1.766(60)(402), 1.729(70)(004), and 1.463(60)(324).

Fluorellestadite is associated with lime, periclase, magnesiocarbonate, hematite, serbrodolskite, anhydrite, and anhydrous lime silicates in burned fragments of petrified wood in coal dumps from the mines of Kopeysk, Chelyabinsk coal basin, south Ural Mountains, USSR. The
new name is for the chemical composition and analogy to ellestadite. The name had appeared in the literature previously (Am. Mineral. 67, 90–96, 1982), but a definitive description had not been given. The new mineral is the F analogue of hydroxyellestadite, Ca$_2$O(SiO$_2$)$_2$(SO$_4$)$_2$(OH)$_2$. Type material is in the Fersman Mineralogical Museum, Moscow. J.P.

**Isocubanite**


The cubic phase of CuFe$_2$S$_3$ has been variously named chalcopyrrhotite, cubanite II, cubic cubanite, and iss (intermediate solid solution of CuFe$_2$S$_3$ composition); the name isocubanite has been approved to designate this cubic polymorph of cubanite. Five electron-microprobe analyses of isocubanite from modern “black-smoker” sulfide chimneys at 21°N, East Pacific Rise, gave Cu 20.79–21.52, Zn 0.77–1.09, Fe 41.64–42.49, S 35.49–35.82 wt%, corresponding to a range of Cu$_{0.94}$Zn$_{0.08}$Fe$_{0.07}$S$_3$ to Cu$_{0.90}$Zn$_{0.07}$Fe$_{0.17}$S$_3$. The mineral is opaque, bronze color, metallic luster, grain size up to 400 μm, typically euhedral with cubo-octahedra present and with rims and/or lamellae of Fe- and Zn-rich chalcopyrite. Pinkish-brown in reflected light, isotropic, slightly browner and softer than pyrrhotite. Reflectivity percentages (SiC standard) are given in 20-nm steps; representative values in air and oil, respectively, are 420, 22.73, 12.94; 460, 26.87, 16.40; 500, 31.34, 20.08; 540, 34.79, 22.73; 580, 37.35, 24.58; 620, 39.11, 25.83; 660, 40.32, 26.80; 700, 41.33, 27.48; 740, 41.91, 27.87; 780, 42.50, 27.42. Single-crystal study showed the mineral to be cubic, space group $Fm\overline{3}m$, $a = 5.303(3)$ Å [slightly larger than that of pure synthetic material ($a = 5.283–5.286$) because of the minor substitution of Zn]. The X-ray powder pattern (114-mm Gandolfi camera, Fe radiation) consists of five lines: 3.059(100)(111), 2.647(20)(200), 1.876(70)(220), 1.602(50)(311), and 1.327(20)(400). Type material is in the Mineralogical Collection of the Ecole Nationale Supérieure des Mines, Paris. J.L.J.

**Kadyrelite**


Microprobe analysis (average of 5) gave Hg 84.36, Br 10.19, Cl 2.93, I 0.01, O (calc.) 1.70, total 99.19 wt%, corresponding to Hg$_{8.99}$(Br$_{1.2}$Cl$_{0.99}$)$_{22.66}$O$_{1.01}$. In 40% KOH the mineral immediately turns black; in HCl, it slowly becomes dark gray, and it is readily soluble in 1:1 HNO$_3$, leaving a cottonlike white residuum. X-ray powder study showed the mineral to be cubic, isosctructural with eglestonite. Space group (by analogy with eglestonite) $Ia\overline{3}d$, $a = 16.22$ Å. Strongest lines of the X-ray powder pattern (28 lines given) are 4.06(30)(400), 3.32(100)(422), 2.63(20)(611,532), 2.57(60-70)(620), 2.34(20)(444), 1.91(20-90)(822,660), and 1.73(20)(664). $D_{\text{calc}}$ = 8.79 g/cm$^3$ with Z = 24. Bright to dull orange color, orange-yellow streak, brittle, vitreous to adamantine luster, H = 2.5 to 3, microhardness 143–192 (average 175) kg/mm$^2$, conchooidal to uneven fracture, no cleavage. Transparent in transmitted light, bright orange-yellow, isotropic, refractive index >2. In reflected light, grayish-white, with weak bluish tint visible at high magnifications. Isotropic, no bireflectance, intense orange internal reflection. Reflectance (nm %): 436, 27.7; 460, 25.3; 500, 21.2; 546, 19.4; 589, 18.1; 620, 17.8; 656, 16.6. Readily polishable, but after exposure in air the polished surface become bluish, then brownish.

Kadyrelite occurs in cavities in carbonate veins, or rarely forms individual grains up to 0.5 mm at the Kadyrelsky mercury ore occurrence, Tuvin'skaya ASSR (USSR), where it is intergrown with eglestonite and bromian eglestonite and is associated with calomel, bromian calomel, kuzminite, corderoite, lavrentievite, etc. The new name is for the locality. Type material is at the Museum of the Institute of Geology and Geophysics (Novosibirsk, USSR), and at the Museum of the Leningrad Mining Institute, Leningrad, USSR. J.P.

**Pottsite**


Electron-microprobe analysis gave PbO 32.4, Bi$_2$O$_3$ 34.0, V$_2$O$_5$ 26.6, H$_2$O 6.71 (Penfield determination on 216 μg), sum 99.71 wt% [corresponding to H$_2$O$_{0.99}$Bi$_{1.99}$(VO$_4$)$_{1.99}$ 2OH$_2$O], ideally HPbBi(VO$_4$)$_2$·2H$_2$O. The special site for H is assigned merely to provide charge balance. The mineral is bright yellow, adamantine luster, pale yellow streak, brittle, H = 3½, $D_{\text{meas}} = ~7.0$, $D_{\text{calc}}$ = 7.31 g/cm$^3$ with Z = 10. Crystals are up to 1 mm long and are dipyramids or stubby prisms terminated by pyramids; {101} is typically dominant, and also present are {110}, {103}, and {211}. In thin section, cloudy yellow, uniaxial negative, $\omega = 2.40$, $\epsilon = 2.30$. X-ray single-crystal study indicated tetragonal symmetry, space group $I4_{2}2$, $a = 11.084$, $c = 12.634$ Å. Strongest lines of the powder pattern (114-mm camera, Cr radiation) are 4.618(90)(121), 4.168(30)(022), 3.210(40)(123), 3.062(100)(132), 2.476(40)(240), 2.252(30)(125), 2.184(30)(051,341), 1.952(30)(235,244), and 1.523(30).

Pottsite occurs near Potts, Lander County, Nevada, in the oxide zone of a tungsten mine. Associated minerals are scheelite, clinobisvanite, bismutite, and vanadinite. Type material is in the British Museum (N.H.), London, England. J.L.J.
Zharchikhite*

Wet-chemical analysis gave Al₂O₃ 59.03, SiO₂ 2.54, MnO 0.07, CaO 0.39, MgO 0.13, F 22.96, H₂O 24.55, O ≈ F 9.67, sum 100.00, and microprobe analysis gave Al₂O₃ 61.8, SiO₂ 0.5, sum 62.3 wt%, suggesting that Mn, Ca, Mg and part of the Si are due to impurities; the ideal formula is AlF(OH)₂. The infrared spectrum has strong absorption bands at 3200–3700 cm⁻¹, proving the presence of OH groups in the mineral. The DTA curve exhibits a marked endothermic effect at 480 °C, a weaker one at 600 °C, and two weak and diffuse ones at 845 and 860 °C. Weight loss (%): 560 °C, 22.04; 560–650 °C, 3.64; 650–800 °C, 4.45; 800–900 °C, 3.23; sum 33.36. After heating to 650 °C the mineral becomes opaque and milky, and its refractive indices and birefringence are significantly lowered. Zharchikhite does not react with acids, but is mildly soluble in NaOH (heating enhances the dissolution rate). The mineral forms drusy aggregates consisting of fine-grained masses that grade into transparent, colorless, prismatic crystals up to 2.5 mm long. The crystals are orthorhombic, elongate [001], with prominent [110] and [010], and terminated by [101] and [111]. Luster vitreous, microhardness 596 kg/mm² parallel to the elongation, 426 kg/mm² perpendicular to it, average 500 kg/mm² (H = 4.5, Mohs). Very brittle, perfect [010] cleavage.

Dmeas = 2.81(1), Dcalc = 2.82 g/cm³. Biaxial negative, ß = 1.532(2), α = 1.552(2), γ = 1.567(2) (592 nm), 2V ≈ 80°, Z ß = c = 43–44°, Y = b, optic-axis plane [010], inclined dispersion, r > v. Single-crystal X-ray study showed the mineral to be monoclinic, space group P2₁/a, α = 5.164(1), b = 7.843(1), c = 5.179 Å, β = 116.244(8)°. The strongest lines (43 given) of the powder pattern are 3.98(100) (011), 2.92(80)(121), 2.31(70)(200), 1.833(90)(231), 1.737(70) (211), and 1.289(70) (402).

Zharchikhite occurs in cavities in hydrothermally mineralized fault breccia in a trachytic neck in the Zharchinka stockwork molybdenum deposit, Zabaykalye, USSR. The new mineral is associated with prosopite, ralstonite, gersdorffite, barite, and siderite. The name is for the place of occurrence. Type material is at the Fersman Mineralogical Museum, Moscow. J.P.

Unnamed Au₃Hg

Chemical analysis gave Fe₂O₃ 17.2, FeO 9.2, MgO 0.2, CaO 12.0, Na₂O 0.8, MnO 16.9, P₂O₅ 40.9, H₂O 4.2, sum 101.4 wt%. The FeO was determined by titration, H₂O by estimation from the 6.7% loss obtained by TGA-EGA, and all others by electron-microprobe analysis. The tentative formula is Fe₁₄₃⁺Fe₁₇⁺Mg₀₂₀Ca₄₈₂Na₁₀₆Mn₁₁⁻P₂₃.₇⁻H₁₉.₂₂O₁₀₈.₂₃, generalized as (Mn⁺⁺Fe⁺⁺Fe³⁺Na⁺⁺Ca⁺⁺Mg⁺⁺)₇(Ca⁺⁺Fe₂⁺Fe⁺⁺Na⁺⁺Ca⁺⁺Mg⁺⁺)(PO₄)(OH,H₂O). The mineral is dark green and has a slightly pearly luster on cleavage surfaces but is dull on fracture surfaces, Dmax = 3.64(5) by suspension, Dcalc = 3.766 g/cm³ with Z = 4. Optically biaxial positive, α = 1.781(3), ß = 1.787(3), γ = 1.796(3), 2V about 75°; intensely pleochroic: X = dark brownish-green, Y = dark green, Z = medium brownish-green, X > Y > Z, strong dispersion r < v. Precission photographs are of poor quality but resemble those of wicksite. The X-ray powder pattern (114.5-mm Gandolfi camera, Fe radiation) also is similar to that of wicksite and yields an orthorhombic cell with a = 12.77(1), b = 12.59(1), c = 11.709(8) Å; strongest lines are 6.31(40)(020), 5.84(50)(002), 2.997(90)(232,411), 2.927(100)(004), 2.769(100)(042,421), and 2.098(60).

The new mineral occurs as a drusy coating on barboralite from the Bull Moose mine, South Dakota. The mineral is thought to be the Mn analogue of wicksite, but more work is needed to resolve the uncertainties in their formulas. The samples studied are in the Smithsonian Institution, Washington, D.C. (NMNH 159890 and 159892). J.L.J.

New Data

Ehrleite
X-ray crystal-structure study of holotype ehrleite showed that the formula is Ca$_2$ZnBe(PO$_4$)$_2$(PO$_4$OH)·4H$_2$O and the cell is triclinic, space group $PI$, $a = 7.130(4)$, $b = 7.430(4)$, $c = 12.479(9)$ Å, $\alpha = 94.31(5)$, $\beta = 102.07(4)$, $\gamma = 82.65(4)^\circ$. The formula and unit cell are new. J.L.J.

**Ramsbeckite**


X-ray crystal-structure determination, utilizing type material provided by one of the co-authors of the 1985 original description of ramsbeckite, led to a revision of the formula to (Cu,Zn)$_2$(OH)$_{22}$(SO$_4$)$_6$·6H$_2$O with $Z = 2$; the original formula was (Cu,Zn)$_2$(OH)$_{10}$(SO$_4$)$_2$·5H$_2$O with $Z = 4$. J.L.J.

**Roggianite**


A new, complete chemical analysis of holotype roggianite revealed the presence of 3.19 wt% BeO. Re-interpretation of the composition, based on the chemical results and crystal-structure considerations, leads to the formula Ca$_5$(Na,K)[Be$_2$Al$_2$Si$_6$O$_{23}$(OH)$_9$]$_4$(OH)$_2$·34H$_2$O. Roggianite is considered to be a zeolite-group mineral: it has an appreciable ion-exchange capacity and attains almost complete rehydration after heating to 750 °C. J.L.J.

**Uranophane**


Uranophane was considered previously to have the formula (H$_2$O)$_2$Ca(UO$_2$)$_3$(SiO$_3$OH)$_2$·3H$_2$O, but X-ray determination of the crystal structure showed that charge balance is attained by (OH)$^-$ in (SiO$_3$OH) tetrahedra rather than by the presence of (H$_2$O). The new formula is Ca(UO$_2$)$_3$(SiO$_3$OH)$_2$·5H$_2$O.

**Discussion.** The new formula should apply also to uranophane-beta, which is dimorphous with uranophane. J.L.J.

**ERRATUM**

Toward a practical plagioclase-muscovite thermometer by Nathan L. Green and Steven I. Usdansky (v. 71, p. 1109–1117). Page 1111: The equation for $T$ in the right-hand column contains a misplaced parenthesis. The following equation should therefore be substituted:

$$
T = \frac{19456A + 12230B + 27320C + 18810D + 8473E + 28226F - 65407G + 65305.4H - 2087.6587 + P(-0.0431 - 0.456A + 0.6653B + 0.364C + 0.364D + 2.1121G + 0.9699H))/(7.5805 - 8.3147 \ln K_D - 1.6544A - 0.7104B + 10.3C + 10.3D - 114.104G + 12.5365H).$
$$