NEW MINERAL NAMES*

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Bulachite*

K. Walenta (1983) Bulachite, a new aluminum arsenate mineral from Neubulach in the northern Black Forest. Der Aufschluss, 34, 445–451 (in German).

Chemical analysis gave Al_2O_3 37.2, As_2O_5 39.1 and H_2O (by weight loss) 25.5, sum 101.8%, leading to the idealized formula $Al_2(AsO_4)(OH)_3 \cdot 3H_2O$. Bulachite is easily soluble in HCl 1:1, less easily in HNO_3 1:1.

Dimensions of the orthorhombic unit cell, as determined from an indexed X-ray powder diffraction pattern, are: a 15.53, b 17.78, c 7.03Å, Z = 10, D (meas.) 2.60, (calc.) 2.55. The strongest of the 42 recorded lines of the powder pattern are: 8.97(7)(020), 7.78(10)(200,120), 6.55(7)(011), 5.92(7)(030), 3.75(7)(321,041), 3.49(8)(150). Possible space groups are given as $Pmnm$, $P2_122_1$, $Pma2$ or $Pmn2_1$.

Bulachite occurs as exceedingly fine-grained needles in radial aggregates encrusting quartz and associated with arsenocrandallite, malachite, azurite, Ba-pharmacosiderite and goethite on two specimens collected from old mine dumps. The mineral is weakly translucent with satiny luster. It is biaxial negative with α = 1.540(2), γ = 1.548(2), $2V$ $ca.$ 66°, r > v. H $ca.$ 2, no cleavage recognized.

The name is from the locality. **A.P.**

Cebaite

Zhang Peishan and TaoKejie (1983) New data for cebaite. Scientia Geologica Sinica, 4, 409–413 (in Chinese with English abstract).

Li Fang-Hua and Fan Han-Jie (1982) Electron diffraction and lattice image study on cebaite. Acta Physica Sinica 31, No. 9, 1206–1214 (in Chinese with English abstract).

Peng Zhizhong and Shen Jinchuan (1979) A study on the superstructure of cebaite. Scientific Papers of Geology for International Exchange, Publishing House of Geology, Beijing, 11–18. (in Chinese with English abstract).

Chemical analyses of three samples gave K_2O 0.37, 0.35, 0.39; Na_2O 0.28, 1.25, 0.80; CaO 0.29, 0.34, 0.24; SrO 0.62, 0.23, 0.29; BaO 43.28, 40.10, 42.26; MgO —, 1.10, 0.17; MnO —, —, —; Fe_2O_3 0.42, 0.31, 0.01; Al_2O_3 0.03, 0.06, 0.07; RE_2O_3 29.03, 28.24, 28.47; ThO_2 0.71, 0.54, 0.67; P_2O_5 0.07, —, 0.62; CO_2 23.43, 24.57, 23.75; F 3.81, 5.15, 3.89; — O = F_2 1.60, 2.16, 1.63; sum 100.74, 100.00, 100.00. Analyses of rare earths (full analyses given) show predominant Ce followed by La, Nd, Pr, Sm and Y. The analyses correspond to $(Ba_{2.73}Sr_{0.06}Ca_{0.05}Na_{0.09}K_{0.07})_{\Sigma=3.00}$

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

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$(RE_{1.71}Fe^{3+}_{0.05}Th_{0.03}P_{0.01})_{\Sigma=1.80}C_{5.15}O_{15.95}F_{1.94}$, $(Ba_{2.47}Sr_{0.02}Ca_{0.06}Na_{0.38}K_{0.07})_{\Sigma=3.00}$ $(RE_{1.63}Fe^{3+}_{0.04}Th_{0.02}Al_{0.01})_{\Sigma=1.70}C_{5.23}O_{15.88}F_{2.56}$ and $(Ba_{2.53}Sr_{0.03}Ca_{0.13}Na_{0.24}K_{0.07})_{\Sigma=3.00}$ $(RE_{1.66}Th_{0.02}P_{0.08}Al_{0.01})_{\Sigma=1.70}C_{4.96}O_{15.66}F_{1.88}$, or ideally $Ba_3Ce_2(CO_3)_5F_2$. The mineral dissolves readily in dilute HCl and in other strong inorganic acids.

Weissenberg photographs, four-circle single-crystal diffractometry and electron diffraction show the mineral to be monoclinic, $C2/m$, Cm or $C2$, a = 21.4256, b = 5.0348, c = 13.2395Å, β = 94.613°. There is a pronounced rhombohedral subcell with a' = 5.11, c' = 9.8Å, similar to the subcell of huanghoite (Am. Mineral., 48, 1179, 1963). The subcell is related to the true cell by 14/3 7/3–2/3 / 010 / 2/3, 1/3 4/3. Strongest lines of one of three given X-ray powder patterns (23 given, including 2β and 5 unindexed lines, indices based on the subcell) are 3.98(8)(101), 3.25(10)(003), 2.52(3)(110), 2.35(3)($\bar{1}$11), 2.20(4)(?), 2.11(8)(201), 1.99(9)(113), 1.26(3)($\bar{1}1\bar{7}$).

The mineral is orange-yellow, wax-yellow, to dark-yellow with a vitreous to waxy luster and orange-yellow to grayish-white streak. The mineral occurs as granular aggregates and tabular grains. Cleavage {30$\bar{1}$} is imperfect and fractures are uneven. H = 4.5–5.0. D(pycnometer) = 4.66, 4.31, 4.44, D calc. = 4.81 g/cm³. Z = 4. Optically the mineral is biaxial negative, α = 1.598–1.604, β = 1.735, γ = 1.740–1.748, $2V$ ~5°.

Infrared spectra show absorption bands at 3420(w), 1470(vs), 1420(vs), 1390(vs), 1090(m), 880(s), 860(s), 720(s), 710(m), 680(w), 620(w), 330(m), 260(s)cm⁻¹. DTA curve shows endothermic peaks at 211°C (w), 703°C (s, escape of CO_2) and 778°C (w, decomposition of $BaCO_3$).

The mineral occurs in a Fe-Nb rare earths deposit at Bayan-Obo, Inner Mongolia, China. The associated minerals are acmite, fluorite, barite, etc.

Discussion

The mineral was first described by Wang et al. in 1973 and was abstracted in this journal (60, 738, 1975) as unnamed $Ba_3Ce_2(CO_3)_5F_2$. The name cebaite is apparently from the composition. The new data show that the mineral is unique and deserves recognition as a species. There are errors in the indexing of the powder patterns. To satisfy the extinction rule for the rhombohedral lattice the indices of the X-ray lines of 2.11 and 1.26Å must be changed to $\bar{2}$01 and $\bar{1}$17. The 2.35 and 2.20Å line are not indexable and are apparently β-lines. The index of the cleavage plane is highly questionable. **G.Y.C.**

Davanite*

K. A. Lazebnik, Yu. D. Lazebnik, and V. J. Makhotko (1984) Davanite, $K_2TiSi_6O_{15}$, a new alkali titanosilicate. Zapiski Vses. Mineralog. Obsh., 113, 95–97 (in Russian).

Electron microprobe analyses (4) gave (range and average)

SiO_2 65.96–68.49 (67.47), TiO_2 14.79–15.44 (15.07), K_2O 16.17–18.26 (17.40), sums 98.02–102.19 (99.95%); the average corresponds to $K_{1.98}Ti_{1.01}Si_{6.01}O_{15.03}$; Mg, Fe, and Na were present. The mineral is the Ti analogue of dalyite. It is insoluble in HCl.

X-ray study showed the mineral to be triclinic, $a = 7.14 \pm 0.03$, $b = 7.53 \pm 0.03$, $c = 6.93 \pm 0.02$Å, $\alpha = 103.35°$, $\beta = 114.48°$, $\gamma = 93.80°$, D. calc. 2.754, meas. 2.76. The strongest lines (37 given) are 3.51(10)($\overline{2}$01), 3.022 (10b)(002), 2.789(7) ($\overline{1}$22), 2.615 (9b)($\overline{2}$12).

Davanite is colorless, luster vitreous. Fracture conchoidal, H. 545 kg/sqmm = 5 Mohs. Optically biaxial, positive (?), $\alpha = 1.623$, $\gamma = 1.668$, both ± 0.002.

The mineral occurs in contact rocks of the Murunskii alkaline massif, in quartz–K-feldspar–calcite rocks, near the Davan spring, extreme western Yakut, A.S.S.R., as grains of pseudo-hexagonal form up to 5 mm in diameter; aegirine, pectolite, and titanite are also present.

The name is for the Davan spring. Samples are preserved at the Fersman Mineralogical Museum, Acad. Sci, USSR, Moscow. **M.F.**

Eclarite*

W. H. Paar, T. T. Chen, V. Kupcik and K. Hanke (1984) Eclarite, $(Cu,Fe)Pb_9Bi_{12}S_{28}$, a new sulfosalt from Bärenbad, Hollersbachtal Salzburg, Austria. Tschermaks Min. Petr. Mitt., 32, 103–110.

Eclarite has been found in gold-bearing copper ores at Bärenbad, west of Hollersbachtal, in the province of Salzburg, Austria. It occurs in fan-shaped aggregates of needle-like crystals up to 1.5 cm long, or as granular fracture-fillings in pyrite and arsenopyrite. Other associated minerals are chalcopyrite, pyrrhotite, sphalerite, stannite, native bismuth, and native gold in a matrix of quartz. The average of 16 microprobe analyses is: Cu 0.9, Fe 0.6, Ag 0.3, Pb 34.3, Bi 45.8, Sb 1.5 and S 17.3, total 100.7 wt.%. leading to the simplified formula given in the title. Dimensions of the orthorhombic unit cell are: $a = 54.76(4)$, $b = 4.030(3)$, $c = 22.75(3)$Å; in this non-standard setting the space group symbol becomes *Pnma*, Z = 4, D (meas.) 6.85, (calc.) 6.88 g/cm³. The strongest lines of the powder pattern are: 3.414 (100)(10.0.0,811,513,712,706), 3.010(60)(015,11.0.6,115,18.0.1), 2.893(70)(11.1.3,914), 2.014(80)(020,23.1.2,5.0.11,23.0.6). Eclarite is whitish-gray (air) and bluish-gray (oil) against galena. Anisotropy of the microindentation hardness is marked, VNH_{50} varies from 87 to 191 kg mm², but the relation to lattice directions is not precisely stated. The name is in honor of Professor E. Clar of Vienna. **A.P.**

Fransoletite*

D. R. Peacor, P. J. Dunn, W. L. Roberts, T. J. Campbell, and D. Newbury (1983) Fransoletite, a new calcium beryllium phosphate from the Tip Top Pegmatite, Custer, South Dakota. Bull. Minéral., 106, 499–503.

Fransoletite, ideal composition $H_2Ca_3Be_2(PO_4)_4 \cdot 4H_2O$ is found as crystal aggregates (up to 3 mm in diameter) in the Tip Top Pegmatite near Custer, South Dakota. It is a secondary mineral associated with beryl. Analysis yield CaO 28.8, MnO 0.3, BeO 9.3, P_2O_5 47.3, H_2O (by difference) 14.3; sum 100.0% (Be determined by atomic absorption, Ca, P and Mn by microprobe). This gives the formula $H_4(Ca_{6.15}Mn_{0.05})_{6.20}Be_{4.46}P_{7.99}O_{32.63} \cdot 7.51 H_2O$.

Powder diffraction combined with Weissenberg and preces-

sion photographs show the mineral to be monoclinic, space group $P2_1/a$, $a = 7.354(7)$, $b = 15.07(2)$, $c = 7.055(7)$Å, $\beta = 96.41(8)°$, Z = 2, D calc. = 2.53, meas. = 2.56(3) g/cm³. The strongest X-ray lines (49 given) are 7.52(40)(020), 6.55(30)(110), 5.06(20)(11$\overline{1}$), 4.57(30)(111), 4.38(30)(12$\overline{1}$), 4.05(30)(121), 3.47(90)(131), 3.32(70)(041), 3.044(100)(211), 2.597(40)(132), 2.317(50)(2.325), 1.878(20), 1.777(30), 1.518(20). Crystals suitable for a crystal structure determination were not found.

The mineral is colorless to slightly whitish. Small fragments are transparent, however clusters and rough crystals are turbid. No fluorescence under ultraviolet radiation was observed. Its streak is white and its luster is subvitreous. The hardness (Mohs) is about 3. There is one imperfect cleavage, {010}, that is easily produced. The fracture is irregular so the surface appears duller than a cleavage surface. It is not noticeably brittle. Its optical properties are: $\alpha = 1.560$, $\beta = 1.566$ and $\gamma = 1.586$ (all± 0.002). Its calculated and measured 2V is 25°. It is biaxial positive, nonpleochroic with no discernible dispersion. It is oriented with $Y = b$ and $Z \wedge c = 14°$.

The name is in honor of Dr. André-Mathieu Fransolet of The University of Liège. Type material is at The Smithsonian Institution. **R.H.L.**

Gebhardite*

O. Medenbach, W. Gebert, and K. Abraham (1983) Gebhardite, $Pb_8OCl_6(As_2O_5)_2$, a new arsenite from Tsumeb, Southwest Africa/Namibia. Neues Jahrb. Mineral. Monatsh., 445–450.

Electron microprobe analysis yielded PbO 75.1, As_2O_3 16.7, Cl 8.9, less O = Cl 2.0, sum 98.7%, leading to the empirical formula $Pb_{7.99}Cl_{5.96}As_{3.99}^{3+}O_{11}$ on the basis of O = 11. The trivalent state of As was established by microchemical tests. Gebhardite is monoclinic, space group $P2_1c$ $a = 6.724(6)$, $b = 11.20(1)$, $c = 34.19(4)$Å, $\beta = 85.2(1)°$, Z = 2, D (calc.) 6.0 g/cm³. The strongest lines of the powder pattern are: 6.70(10)(100), 3.72(8)(125), 3.68(8)(027), 3.55(7)($\overline{1}$25,033) and 3.15(7)(213).

Gebhardite is brown, transparent with adamantine luster and white streak. Its microhardness (VHN) is 80–180 kp/mm² corresponding to 3 (Mohs); its reflectivity is 12% at 589 nm. Cleavage (001) is perfect, (010) good. Gebhardite is biaxial negative, $\alpha = 2.08(1)$, $\gamma = 2.12(1)$; it is faintly pleochroic, *X, Y* pale brown, *Z* brown. Treatment with cold HCl or HNO_3 leads to formation of tiny octahedra of As_2O_3.

Gebhardite has been found on only one specimen, a weathered 5 × 5 × 3 cm mass of white carbonates and silicates coated with a varied association of secondary minerals. Gebhardite in acicular crystals up to 2 mm long ‖*c* is in contact with mimetite, $Pb_5(AsO_4)_3Cl$. Other associated secondary minerals include reinerite, fraipontite, smithsonite, willemite and hematite. The name is in honor of Dr. Georg Gebhard who supplied the specimen. The type material is now at the Ecole des mines, Paris. **A.P.**

γ-goldamalgam
Leadamalgam*

Chen Keqiao, Yang Huifang, Ma Letian and Peng Zhizhong (1981) The discovery of two new minerals—γ-goldamalgam and leadamalgam. Dizhi Pinglun, 27, 107–115 (in Chinese with English abstract).

γ-goldamalgam

Electron microprobe analysis gave Au 36.64, Ag 9.16, Hg 53.17, sum 98.97 wt.%, corresponding to $(Au_{0.69}Ag_{0.31})Hg_{0.98}$ or

ideally, (Au,Ag)Hg. The mineral is not soluble in HCl, H_2SO_4 or HNO_3.

The X-ray powder pattern of the mineral is indexable on a cubic cell with $a = 10.01$Å. The space group is $Im3m$ by analogy to moschellandsbergite (PDF 11-67). Only five X-ray lines are reported: 2.38(10)(330,441), 2.22(10)(420), 2.12(5)(332), 1.45(6)(444), 1.24(8)(811).

The mineral is brass yellow with a strong metallic luster. Under reflected light it is pale brown. The mineral is soft and malleable. VHN(5,10,20) = 150, 89, 77 kg/mm^2, corresponding to 3 on Mohs scale. The mineral is isotropic. Its reflectance for λ = 546 nm is 62.1%.

The mineral occurs as finely granular aggregates in a platinum-bearing ultrabasic stock at Hongshila, Hebei, China. Metallic minerals recovered from the heavy concentrates of crushed ores are cooperite, sperrylite, moncheite, cuproplatinum (?), ferroplatinum (?), laurite, polarite, electrum and others. The name is for the composition.

Leadamalgam

Electron microprobe analyses gave Hg 33.03, 31.48; Pb 66.96, 68.42; sums 99.99, 99.90 wt%, corresponding to $Hg_{1.00}Pb_{2.00}$ and $Hg_{0.96}Pb_{2.04}$, or ideally $HgPb_2$ (compare with altmarkite, unnamed Hg–Pb amalgam, Am. Min., 64, 652–659, 1979). The mineral is not soluble in HCl, H_2SO_4 or HNO_3.

The X-ray powder pattern of the mineral is indexable on a tetragonal cell with $a = 3.545(16)$ and $c = 4.525(20)$Å. The space group is $I4/mmm$, from extinctions in the powder pattern. Only seven X-ray lines are reported: 2.78(w)(101), 2.49(m)(110), 2.25(m)(002), 1.78(m)(200), 1.68(m)(112), 1.49(vs)(211), 1.40(vs)(202).

The mineral is silver white with a strong metallic luster. VHN(1,5,10) = 24, 15, 12 kg/mm^2, corresponding to 1.6 on Mohs scale. Under reflected light the mineral is yellowish white. It is weakly pleochroic, bluish gray to pale bluish gray. The reflectance for λ = 546 nm is 55.1%. The calculated density is 11.96 g/cm^3.

The mineral occurs in a platinum-bearing Cu–Ni-sulfide deposit at Shiaonanshan, Inner Mongolia Autonomous Region, China. The ore minerals present are chromite, ilmenite, magnetite, gersdorffite, pyrite, chalcopyrite, violarite, millerite, galena, stibnite, electrum, niggliite, sperrylite, iridosmine, platinum, merenskyite and kotulskite. Only one grain (50 × 39 × 32 μm) of the mineral has been found in the heavy concentrates of crushed ores. The name is for the composition. G.Y.C.

Henryite*

A. J. Criddle, C. J. Stanley, J. E. Chilsolm, and E. E. Fejer (1983) Henryite, a new copper-silver telluride from Bisbee, Arizona. Bull. Minéral., 106, 511–517.

Electron microprobe analysis of two grains (5 analyses) gave (range and average) Cu 22.0–22.6, 22.3; Ag 29.7–30.4, 30.2; Te 47.1–48.7, 47.5; sum 99.5–100.8, 100.0%. The average corresponds to $Cu_{3.77}Ag_{3.01}Te_{4.00}$ or idealized, $Cu_4Ag_3Te_4$. Henryite is the first phase recorded in the Cu–Ag–Te ternary system.

Single crystal data could not be obtained. The X-ray powder pattern for henryite can be indexed on a face-centered cubic cell with a cell-edge of 12.20(2)Å. The strongest X-ray lines (35 given) are 2.156(10)(440), 3.043(8)(400), 7.03(6)(111),

2.348(6)(511,333), 1.3646(6)(840), 1.2451(6)(844). Based on probable Z = 8, D (calc.) 7.86 g/cm.

In plane-polarized reflected light in air, the isotropic henryite is pale blue; in oil, a purer pale blue. The brightness of mineral is lower in both media than the associated anisotropic hessite and petzite. Reflectances are given at 31 wavelengths, 400 to 700 nm, with 6 values taken on three grains. The reflectances in air: 470 nm, 36.65–37.1; 550 nm, 32.4–32.9; 590 nm, 30.8–31.2; 650 nm, 27.9–28.3%. Vickers microhardness is 109–119.

The mineral occurs in a polished section from the Campbell orebody, Bisbee, Arizona, associated with hessite, petzite, sylvanite, altaite, rickardite and pyrite. Henryite occurs as three anhedral grains ranging in size from 0.1 to 0.8 mm.

The mineral is named for Dr. Norman Fordyce McKerron Henry (1909–1983) of St. John's College, Cambridge, England, and of the Department of Mineralogy and Petrology, University of Cambridge. Type material is preserved at the British Museum (N.H.). J.A.F.

Lennilenapeite*

P. J. Dunn, D. R. Peacor, and W. B. Simmons (1984) Lennilenapeite, the Mg-analogue of stilpnomelane, and chemical data on other stilpnomelane species from Franklin, New Jersey. Can. Mineral., 22, 259–263.

Lennilenapeite, a new mineral species, is triclinic, with $a = 21.9(1)$Å and $d_{(001)} = 12.18(5)$Å. The strongest reflections in the X-ray powder patter are $(d,I/Io)$ 12.11(100), 2.582(40), 1.578(30), 1.593(30), 2.365(30), 2.734(30). Two chemical analyses gave SiO_2 44.5, 45.11; Al_2O_3 5.4, 4.79; Fe_2O_3 5.9, 7.15; FeO 6.4, 7.32; MgO 7.0, 11.39; CaO tr., 0.59; MnO 11.6, 6.22; ZnO 6.3, 4.92; K_2O 3.0, 2.76; Na_2O 0.2, 0.38; BaO 1.3, 0.91; H_2O 8.4, 8.46; sums = 100.0, 100.00 percent. These yield formulae in accordance with the Mg-dominant member of the stilpnomelane group, K_{6-7} $(Mg,Mn,Fe^{2+}, Fe^{3+}, Zn)_{48}(Si,Al)_{72}(O,OH)_{216} \cdot 16H_2O$, Z = 1. Lennilenapeite occurs in two colors; the holotype is dark brown and the cotype is light green. Physical properties of the holotype include hardness (Mohs) ~3; luster, vitreous; cleavage, perfect {001} and imperfect nearly perpendicular to (001); density is 2.72 g/cm^3 (meas.). Optically lennilenapeite is pseudo-uniaxial, $2V = 0$, with indices of refraction $\alpha = 1.553(2)$, $\beta = \gamma = 1.594(4)$; pleochroism is strong; X faint brown to colorless, Y = Z dark brown; absorption $Y = Z > X$. Lennilenapeite is associated with nelenite, tirodite, franklinite, and willemite in the holotype assemblage and with sphalerite and dolomite in the cotype assemblage. Both are from the Franklin mine, Franklin, Sussex County, New Jersey. Lennilenapeite is named for the Lenni Lenape Indians, who were presumably the first inhabitants of the Franklin area and the first to see the deposits. Analytical, X-ray, and optical data are given for a Mn-dominant stilpnomelane from Franklin, tentatively assumed to be parsettensite. The composition of a ferristilpnomelane from Franklin is also presented. [Authors' abstract] J.A.Z.

Magnesiochloritoid

C. Chopin (1983) Magnesiochloritoid, a key-mineral for the petrogenesis of high-grade pelitic blueschists. Bull. Minéral., 106, 715–717.

C. Chopin and W. Schreyer (1983) Magnesiocarpholite and magnesiochloritoid: two index minerals of pelitic blueschists

and their preliminary phase relations in the model system $MgO-Al_2O_3-SiO_2-H_2O$. American Journal of Science, 283-A, 72–96.

A review of the petrographic literature on metapelites and related rocks from blueschist terrains of the Alps and the Mediterranean reveals the following natural occurrences of magnesium-rich chloritoids: (1) with talc, kyanite, garnet, chlorite, and omphacite in mafic microsystems within unfoliated metagabbro, Zermatt area, Western Alps, Switzerland [Bearth (1963) Schwizer min. pet. Mitt., 43, 269; Berth (1967) Beitr. geol. Karte Schweiz, Neue Folge, 132, 1; Chinner and Dixon (1973) Jour. Petrology, 14, 185.] (2) with talc, kyanite, and either quartz or chlorite in pelitic pods within eclogite, Hohe Tauern, Eastern Alps, Austria [Miller (1974) Schweizer min. pet. Mitt., 54, 371; Miller (1977) Tschermaks min. pet. Mit., 24, 221.] (3) with talc, chlorite, quartz, kyanite and phengite in talc-chloritoid quartzite, Monte Rose area, Western Alps, Italy [Chopin, unpub. data.] The natural Mg-dominant chloritoids analyzed so far contain up to 74 mol % of the Mg end-member, and appear to be useful indicators of blueschist metamorphism in pelitic rocks.

Pure "magnesiochloritoid", $MgAl_2O(SiO_4)(OH)_2$, was synthesized from the anhydrous composition $MgO-Al_2O_3-SiO_2$ at water pressures in excess of 30 kbar and at temperatures between 600 and 700°C. Powder X-ray diffraction analysis of the synthetic products revealed that both monoclinic and triclinic polytypes were formed. The triclinic phase dominated and proved to be increasingly abundant at higher temperatures. This synthetic triclinic phase has the following cell parameters: $a = 9.43$, $b = 5.44$, $c = 9.13$Å; $\alpha = 96.4°$, $\beta = 101.1°$, $\gamma = 90.0°$; space group $C2/c$.

The pure synthetic Mg end-member is incompatible with quartz, while natural Mg-rich chloritoids occur with quartz.

Discussion

In emphasizing the significance of Mg enrichment as an indicator of blueschist metamorphism in pelitic rocks, the authors point out that Mg-dominant chloritoids occur naturally. It should be noted, however, that the name "magnesiochloritoid" or "Mg-chloritoid" has not yet been submitted to the Commission on New Minerals and Mineral Names. **J.A.Z.**

Manganotapiolite* Ferrotapiolite*

S. I. Lahti, B. Johanson and M. Virkkunen (1983) Contributions to the chemistry of tapiolite-manganotapiolite, a new mineral. Bull Geol. Soc. Finland, 55, 2, 101–109.

Manganotapiolite, ideal composition $(Mn, Fe)_2(Ta,Nb)_4O_{12}$, is found as small crystals in a narrow lithium pegmatite dike in the Eräjärvi area in Orivesi, southern Finland. Analysis (microprobe) showed that only certain regions of a tapiolite crystal were rich enough in Mn to be called manganotapiolite while other regions of the same crystal were ferrotapiolite. The variation in composition is not due to inclusions. The changes in the Mn/Fe ratio are both gradual and irregular. Analysis of five points within one of the Mn-rich regions gave: FeO 6.4, 6.2, 3.7, 3.9, 3.2; MnO 6.7, 7.7, 8.6, 9.7, 10.2; CaO 0.4, 0.2, 0.6, 0.2, 0.4; Ta_2O_5 78.1, 77.6, 78.6, 79.8, 76.3, Nb_2O_5 7.1, 7.6, 7.2, 6.7, 8.5; TiO_2 0.1, 0.1, 0.0, 0.0, 0.0; SnO_2 1.0, 1.2, 1.3, 1.0, 1.0; Sb_2O_3 0.0, 0.0, 0.0, 0.0, 0.1; Total 99.8, 100.6, 100.1, 101.4 and 99.7 wt. %. (All analyses by microprobe). This gives the formula (assum-

ing O = 6 and Z = 2): $(Mn_{0.59}Fe_{0.32}Ca_{0.03})_{0.94}(Ta_{1.72}Nb_{0.27}Sn_{0.04})_{2.03}O_6$.

Single crystal and powder X-ray diffraction shows the mineral to be tetragonal, space group $P4_2/mnm$, $a = 4.762$ and $c = 9.272$Å. The strongest X-ray lines (19 given) are: 4.64(20)(002), 4.24(40)(101), 3.367(100)(110), 2.724(20)(112), 2.592(90)(103), 2.381(60)(200), 1.754(90)(213), 1.682(60)(220), 1.504(40)(320,302), 1.411(40)(303,116). A rutile substructure was detected. The calculated density is 7.72 g/cm³.

The mineral is dark brown as is its streak. Its hardness (VHN) is 711 (100 g load). The crystal studied was prismatic with poorly developed faces ({100}). It is strongly pleochroic going from yellowish brown to reddish brown, however thicker fragments are opaque. Its color by reflected light is grey with a weak bireflectance from light brownish grey to grey. There are strong red-brown internal reflections. The reflectance values, in air, are 16.0–15.7 (470 nm), 14.7–14.1 (546 nm), 15.0–14.8 (589 nm), and 15.1–14.6 (650 nm) and, in oil, are 4.7–4.0 (470 nm), 3.9–3.4 (546 nm), 4.3–3.8 (589 nm), and 4.3–3.8 (650 nm).

Type material is deposited at the Mineralogical Museum of The Geological Survey of Finland.

Mention is made that the I.M.A. Commission on New Minerals and Mineral Names has approved the use of the name *ferrotapiolite* for Fe-dominant members of the tapiolite series. **R.H.L.**

Pokrovskite*

O. K. Ivanov, Yu. A. Malinovskii, and Yu. V. Mozherin (1984) Pokrovskite, $Mg_2(CO_3)(OH)_2 \cdot 0.5H_2O$, a new mineral from the Zlatorgorskaya layered intrusive, Kazakhstan. Zapiski Vses. Mineralog. Obsh., 113, 1, 90–95.

Analysis gave MgO 50.80, MnO 1.02, Fe_2O_3 (total Fe) 1.90, CaO 0.39, BaO 0.10, Na_2O 0.10, $K_2O<0.10$, $Al_2O_3<0.05$, $SiO_2<0.10$, H_2O^+ 16.72, H_2O^- 0.44, CO_2 28.78, sum 100.50%, corresponding to: $(Mg_{1.93}Fe^{+3}_{0.04}Mn_{0.02})(CO_3)_{1.0}(OH)_{2.0} \cdot 0.42 H_2O$. Special tests showed that there is no Ca in the mineral; CaO reported was probably due to admixed dolomite. The infrared spectrum showed that both OH and H_2O were present. The D.T.A. curve shows one endothermic effect with maximum at 520°C. Insoluble in H_2O, dissolved by dilute HCl. Turns brown when heated.

X-ray study showed the mineral to be monoclinic, isostructural with malachite and therefore assumed to have space group $P2_1/a$, $a = 9.43$, $b = 12.27$, $c = 3.395$Å, $\beta = 96.6°$ Z = 4. The strongest lines (30 given) are 6.10(7)(020), 4.70(7)(200), 3.73(7)(130), 2.60(10)(031,201), 2.17(9)(301), 1.661(7b) (501,302,032). D. 2.58 calc., 2.51–2.52 on crystals, 2.27–2.32 on aggregates.

Pokrovskite is white with a flesh tint, luster dull, streak white. Crystals are prismatic in acicular, in spherulitic aggregates, in section opaque because of micro-inclusions. H about 3, Optically biaxial, negative $\alpha = 1.537$, $\beta = \gamma = 1.619$, $2V = 18°$ (it is stated that calculation gives $\beta = 1.611$), elongation negative, $X \wedge C = 8°$.

The mineral occurs in the Zlatorskaya intrusive, central Kazakhstan, in a vein within dunite, associated with dolomite, magnesite, and a sjögrenite-like mineral.

The name is for the Ural mineralogist Pavel Vladimirovich Pokrovskii (1912–1979). Type material is at the Fersman Mineralogical Museum, Acad. Sci., Moscow. **M.F.**

Tausonite*

E. I. Vorob'ev, A. A. Konev, Yu. V. Malyshonok, G. F. Afonina, and A. N. Sapozhnikov (1984) Tausonite, $SrTiO_3$, a new mineral of the perovskite group. Zapiski Vses. Mineralog. Obsh., 113, 83–89 (in Russian).

Analyses 1 (on 0.05 g by G. S. Gormesheva) and 2 (on 2 g by R. V. Bondareva, T. I. Elizar'eva, and V. M. Norikov) gave, resp., TiO_2 44.60, 43,40; Al_2O_3 0.70, trace; Fe_2O_3 1.80, 1.22, MnO 0.04, 0.005, MgO 0.10, 0.11; CaO 2.36, 2.76; SrO 42.00, 39.26; BaO 1.60, 0.40*; Nd_2O_3 none, 0.91*; Nb_2O_5 0.001*, 0.13*; ZrO_2 none*, 0.07*, sum 100.24, 99.18%.(* = Spectrographic) After deducting impurities, these yield:

1. $(Sr_{0.85}Ca_{0.02}Ba_{0.02}Na_{0.02}K_{0.02})TiO_3$,
2. $(Sr_{0.70}Ca_{0.03}Na_{0.103}Ce_{0.046}La_{0.026}Nd_{0.01}Ba_{0.005}K_{0.007})$
$(Ti_{1.003}Nb_{0.000})$ O_3. The mineral is insoluble in dilute acids.

X-ray study shows that tausonite is cubic, space group $Pm3m$, Z = 1. The strongest lines for tausonites 1 and 2 are: 2.761,2.771(100), 1.952(50), 1.959(44)(200), 1.594(30), 1.600(22)(211); $a = 3.9048 \pm 0.0001$; 3.913Å., D. calc. 4.83 (no. 1), 4.86 (no. 2), (meas.) 4.88.

Tausonite occurs in alkalic rocks of the Murunskii massif, Aldan, as irregular grains, 0.01–2 mm, or as cubes and cubo-octahedra up to 2 mm. Color ruby-red, brownish-red, dark reddish-brown and gray, luster adamantine, fracture conchoidal, brittle, H. 6–6.5. Isotrophic to slightly anisotropic.

The name is for L. V. Tauson, Russian geochemist. Type material is at the Fersman Mineralogical Museum, Acad. Sci. USSR, Moscow.

Discussion

A mineral intermediate between tausonite and loparite has recently been described from Paraguay and Brazil by Haggerty and Mariano, Contrib. Mineral Petrol., 84, 365–381 (1983). **M.F.**

Tongbaite*

Tian Peixue, Fang Qingsong, Chen Keqiao and Peng Zhizhong (1983) A study on tongbaite—a new mineral. Acta Mineralogica Sinica, 4, 241–245 (in Chinese with English abstract).
Chen Keqiao, Tian Peixue, Shi Nicheng and Peng Zhizhong (1983) A study on tongbaite, Cr_3C_2,—a new mineral. Ziran Zazhi, 6, 478–479 (in Chinese).

The average of four electron microprobe analyses, using Cr metal and graphite as standards, gave Cr 84.26, Fe 1.18, Ni 1.25, C 13.37, sum 100.06 wt. %, corresponding to $(Cr_{2.906}Fe_{0.036}Ni_{0.036})_{\Sigma2.978}C_2$ or ideally Cr_3C_2. The mineral is not soluble in HCl, H_2SO_4 or HNO_3. It is weakly attacked by aquaregia.

Weissenberg and precession photographs show the mineral to be orthorhombic, $Pnma$, $a = 5.57(5)$, $b = 11.47(8)$ and $c = 2.816(8)$Å, Z = 4. The X-ray powder pattern is comparable to that of synthetic Cr_3C_2. The strongest X-ray lines are (20 given) 2.30(100)(121), 2.23(80)(230), 1.94(30)(211), 1.86(30)(221), 1.81(30)(310), 1.78(30)(051), 1.70(40)(151), 1.193(70)(232), 1.164(40)(091).

The mineral is pale brownish yellow with dark gray streak and strong metallic luster. The mineral is brittle and non-magnetic. The crystals are pseudo-hexagonal, prismatic (0.1 × 0.3 mm), some crystals have spear-like terminations. VHN(20,50,100) = 2200, 1931, 1885 kg/mm², corresponding to 8.5 on Mohs scale.

The mineral is pale purple in reflected light. It is strongly

anisotropic with distinct bireflectance and reflection pleochroism, purplish yellow to orange yellow. Reflectances (λ in nm, R_1, R_2 in %) are 405, 46.54, 49.10; 436, 48.50, 51.28; 480, 51.14, 53.86; 526, 53.72, 55.94; 546, 54.68, 56.89; 578, 57.07, 57.51; 589, 57.38, 57.82; 622, 58.72, 57.68; 644, 60.33, 59.02; 656, 61.50, 59.97; 664, 61.56, 59.97; 700, 61.35, 59.20. Color values are (R_1, R_2):R_{vis} 55.7949, 56.9757; x 0.3483, 0.3429; y 0.3454, 0.3438; λ_d 581 nm, 577 nm; P_e 0.0847, 0.0681.

The mineral occurs in ultrabasic rocks at Liu Zhuang, Tongbai County, Henan, China. The associated minerals are magnesiochromite, pyrrhotite, pentlandite, pyrite, chalcopyrite, magnetite, ilmenite, altaite, cubanite, violarite, bismutohauchecornite, awaruite, lead, chromium, gold, copper, platinum, forsterite, phlogopite, apatite, diopside, enstatite, and hydrogrossular. The mineral also occurs in the ultrabasic rocks in the Hong district, Tibet, China, where it is associated with sulfides and oxides of iron, platinum group minerals, copper, olivine, pyroxene, diamond, moissanite and pyrope. The name is for the locality. **G.Y.C.**

Yimengite*

Dong Zhenxin, Zhou Jianxiong, Lu Qi and Peng Zhizhong (1983) Yimengite, $K(Cr,Ti,Fe,Mg)_{12}O_{19}$, a new mineral from China. Kexue Tongbao, 15, 932–936 (in Chinese).

Electron microprobe analyses of two grains, using chromite, ilmenite, feldspar, jadeite and artificial glass as standards, gave K_2O 3.75, 3,92; MgO 7.89, 6.79; CaO —, 0.20; MnO —, 0.37; FeO 2.13, 1.54; Fe_2O_3 18.03, 18.07; Al_2O_3 1.61, 1.30; Cr_2O_3 37.06, 36.94; TiO_2 29.15, 30.75; SiO_2 0.55, 0.31; Nb_2O_5 —, 0.18; sums 100.17, 100.37 wt. %. The analyses correspond to $K_{0.71}(Cr_{4.35}Ti_{3.25}Fe^{3+}_{2.01}Mg_{1.75}Al_{0.28}Fe^{2+}_{0.26}Si_{0.08})_{\Sigma11.98}O_{19}$ and $K_{0.78}$ $(Cr_{4.58} Ti_{3.62} Fe^{3+}_{2.13} Mg_{1.59} Al_{0.24} Fe^{2+}_{0.20} Si_{0.05} Mn_{0.05} Ca_{0.03} Nb_{0.01})_{\Sigma12.50}O_{19}$, or ideally, $K(Cr, Ti, Fe, Mg)_{12}O_{19}$. Z = 2. The mineral is not soluble in dilute HCl or HNO_3.

Precession and Weissenberg photographs showed the mineral to be hexagonal, $P6_3/mmc$, $a = 5.875(1)$ and $c = 22.940(5)$Å. The mineral is structurally similar to magnetoplumbite (Am. Min. 36, 512–514, 1951). The strongest lines in the X-ray powder pattern (13 given) are 2.780(9)(107), 2.630(10)(114), 2.240(5)(205), 1.665(6)(217), 1.622(9)(304), 1.475(8)(220).

The mineral is black with a brown streak. It is opaque with a metallic luster. Mineral grains (0.5–2 mm) are irregular, platy to tabular; {0001} cleavage is perfect and {10$\bar{1}$1} cleavage is present on some grains. Density obs. 4.34, calc. 3.50 g/cm³ (4.35 g/cm³, calculated by GYC from analysis 1). VHN(20) = 273 kg/mm², corresponding to 4.1 on Mohs scale. Under reflected light the mineral is gray to grayish white with weak pleochroism. Reflectances in air (λ in nm, R_p', R_g', in %) are 402, 12.7, 17.7; 438, 11.3, 18.2; 498, 15.1, 16.0; 548, 15.7, 16.2; 588, 13.0, 16.5; 624, 13.5, 16.7; 641, 12.6, 15.5.

The mineral occurs in kimberlite dikes in the Yimengshan area, Shandong, China. The associated minerals are olivine, phlogopite, pyrope, chromite, ilmenite, chromian diopside, apatite, zircon, moissanite and perovskite. The name is for the locality. **G.Y.C.**

Unnamed cobalt sulfide

Economou, M., S. Scounakis and C. Sideris (1981) On the presence of a Co–Fe–sulfide in the mineralization from Peri-

voli (W. Macedonia, Greece) Annales Geologiques des Pays Hellenique 30(2), 534–542.

Microprobe analyses (11 analyses) of the mineral gave (range and average) Co 57.34–63.61, 61.37, Fe 5.48–11.20, 7.40, Cu 0.49–0.73, 0.65, Ni 0.40–0.61, 0.51, S (by difference) 29.22–30.89, 30.07, totals 100%. [This average, with S by difference, corresponds to $(Co_{2.42}Fe_{0.43}Cu_{0.03}Ni_{0.03})_{3.91}S_{3.09}$, or ideally Co_4S_3 (JAF)]. No reason is given for sulfur analyses not being reported.

No X-ray data are given. The mineral occurs as exsolutions in hexagonal pyrrhotite, as does troilite. The pyrrhotite is associated with magnetite, pyrite, chalcopyrite and troilite, in quartz.

The mineral occurs in the abandoned mine of Tsouma Hill, near Perivoli, Grevena district, west Macedonia, Greece. **J.A.F.**

Unnamed copper arsenide

M. Tarkian, W.-D. Bock and M. Neumann (1983) Geology and mineralogy of the Cu–Ni–Co–U ore deposits at Talmessi and Meskani, central Iran. Tschermaks Mineral. Petrol. Mitt., 32, 111–133.

Analysis by electron microprobe yielded Cu 64.1, Ag 0.2, As 37.6, sum 101.9%, corresponding to Cu_2As.

The new phase, mineral 'x', occurs as pinkish-grey, extremely anisotropic lamellae inclusions in koutekite, probably formed as a decomposition of koutekite. The optical properties (not given) differ distinctly from koutekite. The koutekite-mineral 'x' assemblage occurs at both the Talmessi and Meskani mines, Anaraki district, central Iran. **J.A.F.**

Unnamed Cr-analogue of phengite

E. V. Rumantseva, K. S. Mishchenko, and L. I. Kalinicheva (1984) Taeniolite and chromian-vanadian micas in metasomatites of Karelia. Zapiski Vses. Mineralog. Obshch., 113, 68–75 (in Russian).

Two microprobe analyses and a complete chemical analysis are given of a mica; the complete analysis is SiO_2 51.70, TiO_2 0.12, Al_2O_3 4.00, Fe_2O_3 1.20; Cr_2O_3 17.93, V_2O_3 0.87, FeO none, MgO 8.86 MnO 0.03, Li_2O 0.35, CaO 0.13, Na_2O 0.08, K_2O 9.47, H_2O^- 0.5, loss on ignition 3.77, F 1.13, sum 99.79 − (O = F_2) 0.46 = 99.33%. This is calculated to the formula $(K_{0.86}Na_{0.01}Ca_{0.01})_{0.88}$ $(Mg_{0.95}Li_{0.10}Cr^{+3}_{1.01}V^{+3}_{0.05}Fe^{+3}_{0.06}Al_{0.02})_{2.19}$ $(Al_{0.32}Si_{3.68})O_{10}(OH_{1.75}F_{0.25})$.

The mineral occurs as fine-grained aggregates in dolomite and mudstones. Color ranges from gray-green to emerald-green. Biaxial, negative, $2V$ 10–12°; ns α 1.604, β 1.647, γ 1.653, X colorless to greenish, Y and Z green, D 2.915. The strongest X-ray lines are 9.92 (74), 4.96 (44), 3.32 (100), 3.09 (26), 2.90 (25), 1.99 (35). These are indexed on a monoclinic cell, $a = 5.27$, $b = 9.08$, $c = 10.12$Å, $\beta = 100° 22'$, D calc. 2.935.

Discussion

This does not correspond to phengite, in which Al is dominant in the octahedral position. It is rather the chromium-dominant analogue of phengite or, if you prefer, a chromium-magnesium mica. I believe it should be considered a new species and named. **M.F.**

Unnamed Pb–Bi–Te–S mineral

E. Aydin (1983) Pb–Zn ore deposits and sulfosalts of the Biga Peninsula, Turkey. Istanbul Yerbilimleri (Istanbul Earth Sci. Res.) 3, (1–2), 53–76. (Turkish with English abstract).

Microprobe analysis of a Pb–Bi–Te mineral gave Pb 23.41, 22.70, 22.17, 22.35, 22.58 (average 22.64); Bi 59.76, 62.65, 59.06, 60.67, 58.57 (average 59.94); S 5.64 5.97, 6.30, 7.16, 7.12, (average 6.44); Te 11.19, 9.68, 12.47, 11.92, 9.63 (average 10.98), sum = 100.00 percent. This corresponds to $Pb_{1.22}Bi_{3.22}S_{2.22}Te_{1.00}$. **M.F.**

Unnamed Pb Cu Se

Yu. M. Dymkov, T. I. Loseva, and V. E. Boitsov (1983) Alteration of Cu–Fe-sulfides in the process of formation of berzelianite in the Rozhna deposit (Moravia, Czechoslovakia). Novy Dannye Mineral, 31, 41–51 (in Russian).

Microprobe analysis by T.I.L. gave Cu 18.1, Pb 59.5, Se 22.8, total 99.8%, corresponding closely to Pb Cu Se. The mineral occurs as two grains in calcite (8 × 10 and 3–5 μm), pale yellow in reflected light, rimmed by a fine band of berzelianite. **M.F.**

New Data

Andorite series: senandorite, quatrandorite, fizelyite, and ramdohrite

Y. Moëlo, E. Makovicky and S. Karup-Møller (1984) New data on the minerals of the andorite series. Neues Jahrb. Mineral., Monatsh., 175–182.

New data from intergrated optical, chemical and X-ray re-examination of natural samples of the andorite-fizelyite series of minerals are presented, and a revised system of nomenclature is proposed.

Senandorite (previously recognized as "andorite VI") is described as gray-white in polished sections, with weak anisotropy in khaki and greenish. It does not display twinning. Single crystal X-ray photographs reveal orthorhombic diffraction symmetry, $mmmPn^*a$ (space groups $Pnma$ or $Pn2_1a$), and unit cell dimensions $a = 13.02$, $b = 19.18$, $c = 25.48$Å. A subcell with $c' = c/6$ and diffraction symmetry $mmmBb^{**}$ is evident. The ideal unit cell content appears to be $Pb_{20}Ag_{24}Cu_2Sb_{74}S_{144}$.

Quatrandorite (previously "andorite IV") is optically similar to senandorite, but it displays deeper pleochroic colors and ubiquitous twinning. X-ray analysis reveals monoclinic symmetry of diffraction group $^{**}2/mP$ $^{**}2_1/a$ and unit cell parameters $a = 13.04$, $b = 19.18$, $c = 17.07$Å, and $\gamma = 90°$. A subcell with $c' = c/4$ and symmetry $^{**}mB^{**}b$ is also characteristic. The ideal composition is estimated as $Pb_{18}Ag_{15}Sb_{47}S_{96}$.

Fizelyite and ramdohrite are physically very similar. Both are light gray in polished section, show anisotropy without distinct color effects, and display two sets of polysynthetic twins, parallel to c and to (001). For both phases, X-ray examination reveals monoclinic diffraction symmetry $m^{**}P2_1/n^{**}$ and a prominent subcell characterized by $c' = c/2$ and symmetry $mmmBb^{**}$. Cell dimensions for fizelyite are: $a = 13.21$, $b = 19.27$, $c = 8.68$Å, $\alpha = 90.4°$. Parameters for ramdohrite are: $a = 13.09$, $b = 19.24$, $c = 8.73$Å, $\alpha = 90.3°$. The two minerals are best differentiated by chemical analysis. The ideal formula of fizelyite is $Pb_{14}Ag_5Sb_{21}S_{48}$, while that of ramdohrite is $Pb_{12}Ag_6Sb_{22}S_{48}$.

Observed exsolution phenomena and distinctive patterns of minor element incorporation, together with these chemical and crystallographic data, indicate that the andorite series may be divided into the andorite and fizelyite subseries, within which the above-described minerals function as discrete phases.

Discussion

To facilitate comparison with previous descriptions of andorite series minerals, the authors employ complete diffraction aspect symbols throughout. They also point out that aspects of their revised classification system, particularly their correlations of chemistry with crystallography and the recognition of "andorite IV" (quatrandorite) as an independent phase, are not universally accepted. It should be noted that neither their system of nomenclature nor their use of new mineral names (quatrandorite and senandorite) has yet been submitted to the Commission on New Minerals and Mineral Names. **J.A.Z.**

Cacoxenite

P. B. Moore and J. Shen, (1983), An X-ray structural study of cacoxenite a mineral phosphate. Nature, 306, 356–358.

Based on a crystal structure study to $R = 0.118$, cacoxenite is found to have the formula $[AlFe_{24}^{3+}O_6(OH)_{12}(PO_4)_{17}(H_2O)_{24}] \cdot \sim51\ H_2O$, the contents within the brackets represent the structural framework and the remaining water evidently occurs in large (diameter = 14.2Å) channels. Crystal data are $a = 27.559(1)$, $c = 10.550(1)$Å, $Z = 2$, space group $P6_3/m$. **R.H.L.**

Ingodite

E. N. Zav'yalov, V. D. Begizov, and V. Ya. Tedchuk (1984) Additional data on the chemical composition of ingodite. Zapiski Vses Mineralog. Obsh., 113, 31–35.

The composition of ingodite (67, 855 (1982)) was given as Bi_2TeS, based on 5 microprobe analyses (Bi 68.8–73.3, Pb, 0–1.2, Sb 0–0.15, Te 19.3–25.3, S 5.1–6.3, Se 0–0.4%. Twelve new analyses (samples verified by X-ray study) from Ingoda, Transbaikal; Cumberland, England; Kamchatka; and southern Urals gave Bi 51.1–73.3, Pb 0.6–10.6, Te 19.3–32.1, S 5.2–6.3, Se 0–0.4%, giving formulas ranging from $(Bi_{2.00}Pb_{0.02})Te_{0.86}(S_{1.12}Se_{0.02})$ to $(Bi_{1.38}Pb_{0.24})Te_{1.42}S_{0.95}$; the ratio (Bi): (Te,S) ranges from 3:4 to 5:7. **M.F.**

Kankite

A. Kato, S. Matsubara, K. Nagashima, I. Nakai and M. Shimizu (1984) Kankite from the Suzukura mine, Enzan city, Yamanashi Prefecture, Japan. Mineral. J., 12, 6–14 (Eng.)

Kankite (Am. Mineral., 62, 594 (1974)) occurs as a yellow-green earthy material composed of spherules of very thin tablets, less than 10 μm across, filling spaces in soily material, or as a superficial coating on quartz fragments, in a wet depression on the dump of the Suzukura mine.

Chemical analysis, recalculated to 100%, yields Fe_2O_3 35.24, As_2O_5 41.37, SO_3 2.26, H_2O 21.13, total 100.00%, yielding an empirical formula, calculated on anhydrous O = 4, $Fe_{1.07}^{3+}$ $(As_{0.87}S_{0.07})_{0.94}O_4 \cdot 2.85H_2O$, or $FeAsO_4 \cdot 3H_2O$, corresponding well to the original $FeAsO_4 \cdot 3.5H_2O$. An alternative ideal formula, calculated with (As+S) = 7, yields $Fe_8^{3+}[(As,S)O_4]_7 \cdot (H_2O,OH)_{22-24}$, where As:S ~13:1. Strongest lines (36 given) are 12.82(100), 4.26(35), 7.52(30), 4.77(28), 7.23(25b), 3.70(25), corresponding well to those of the original kankite. No unit cell data could be directly determined, so neither ideal formula is preferred.

The mineral has a dull to vitreous luster, H about 3, D = 2.60(1) g/cm³ (meas.). Refractive indices are $n_{max} = 1.680(2)$, and $n_{min} = 1.664(2)$. DTA and TG curves and infrared absorption spectra differ slightly from the original occurrence. **J.A.F.**

Pierrotite

P. Engel, M. Gostojić, and W. Nowacki (1983) The crystal structure of pierrotite, $Tl_2(Sb,As)_{10}S_{16}$. Zeitschrift für Kristallographie, 165, 209–215.

The crystal structure determination is reported for pierrotite, $Tl_2(Sb,As)_{10}S_{16}$. The structure was refined in orthorhombic space group $Pna2_1$, with Z = 4, and $a = 38.746(8)$, $b = 8.816(2)$, $c = 7.989(2)$Å. (Refinement in the non-centric space group was chosen when statistical analyses gave no clear indication of centrosymmetry. The final R-value was 0.072, with 2975 observed reflections.) The pierrotite structure contains AsS_3 and SbS_3 pyramids and SbS_4 and SbS_5 coordination polyhedra which connect to form the first reported three-dimensional framework of (As,Sb) polyhedra.

Discussion

The crystal structure determination and supporting microprobe analyses reported in this study yielded the formula $Tl_2(Sb,As)_{10}S_{16}$, rather than the previously reported formula $Tl_2(Sb,As)_{10}S_{17}$ (Guillemin et al., Bull. Soc. Fr. Minéral. Cristallogr., 93, 66–71). The refined cell dimensions agree well with previously published data. However, the axes have ben reoriented (a' = b, b' = a, c' = c), to yield the reported space group $Pna2_1$, rather than the previously published equivalent space group $Pbn2_1$ (noncentrosymmetric) or $Pbnm$ (centrosymmetric). **J.A.Z.**

Sharpite

J. Čejka, Z. Mrázek and Z. Urbanec (1984) New data on sharpite, a calcium uranyl carbonate. Neues Jahrb. Mineral., Monatsh., 109–117.

The results of chemical, optical, infrared absorption, thermal decomposition, and X-ray powder diffraction analyses are reported. The previously proposed chemical formula, $Ca(UO_2)_6(CO_3)_5(OH)_4 \cdot 6H_2O$, is confirmed. The indexing and refinement of the powder pattern yield the following orthorhombic cell dimensions: $a = 21.99(2)$, $b = 15.63(2)$, $c = 4.487(4)$Å. The strongest of the 19 indexed reflections given include [d(obs) in Å, I, hkl]: 4.497(100)(420,001), 3.910(48)(040), 7.82(40)(020), 5.34(35)(320), 2.996(33)(630), 11.02(30)(200). The density (previously reported as 3.30 g/cm³) is corrected to a value in excess of 4.45 g/cm³ (meas.) or 4.51 g/cm³ (calc.). **J.A.Z.**

Sursassite

M. Mellini, S. Merlino, and M. Pasero (1984) X-ray and HRTEM study of sursassite: crystal structure, stacking disorder, and sursassite–pumpellyite intergrowth. Physics and Chemistry of Minerals, 10, 99–105.

Combined X-ray diffraction and high resolution electron microscopic analyses of the manganese and aluminum silicate sursassite, $Mn_2Al_3[(OH)_3(SiO_4)(Si_2O_7)]$, have revealed that this mineral, generally ascribed to the epidote group, has close structural affinities to pumpellyite, $Ca_2Al_3[(OH)_3(SiO_4)(Si_2O_7)]$, and is basically isostructural with macfallite, $Ca_2Mn_3[(OH)_3(SiO_4)(Si_2O_7)]$. Sursassite, monoclinic, with $a = 8.70(1)$, $b = 5.79(1)$, $c = 9.78(1)$Å, $\beta = 108.9(1)°$, was refined in space group $P2_1/m$. (1096 reflections, anisotropic $R = 0.65$). Its microstructure displays varying degrees of disorder and structural defects. The dominant defect consists of stacking faults parallel to (001) which separate ideal sursassite lamellae from lamellar domains of pumpellyite-structured sursassite. **J.A.Z.**

NOTICES

NATO Advanced Study Institute on Iron in Soil and Clay Minerals

This Advanced Study Institute is designed to offer an in-depth understanding of the chemistry of iron in soil and clay minerals. The properties, behavior, and occurrence of iron in soil and in the 1:1 and 2:1 phyllosilicates will be presented to give insight into its many forms and its effects on many soil and mineral properties. Topic leaders will discuss the reactions of iron with other soil components, methods of separation and analysis, and phase transformations, translocation, and weathering of iron minerals. Special sessions are also planned to discuss and critique methods of characterizing iron, including diffraction, microscopy, magnetic susceptibility, and magnetic resonance, Mössbauer, infrared, and uv-visible spectroscopy. Some of these methods will be explored in greater depth during problem-solving sessions.

Kur and Kongress Hotels, Bad Windsheim, Federal Republic of Germany, July 1–13, 1985.

Organizing Committee: Joseph W. Stucki, Bernard A. Goodman, and Udo Schwertmann.

For Information Write or Phone: NATO ASI, University of Illinois, Agronomy Department, W201 Turner Hall, 1102 S. Goodwin, Urbana, IL 61801, 217-333-5231.

Request for Abstractors

The *new mineral names* section of the American Mineralogist is a collective effort on the part of many mineralogists. The bulk of the abstracting has been done in recent years by Dr. Michael Fleischer, but there is now a need for additional abstractors. The most urgent need is for those willing to prepare abstracts of new minerals described in German, French, Russian, and those languages employing the Cyrillic alphabet. There is also a need for abstractors of papers written in English. Those interested in contributing to this most important part of the Society's work should write to Dr. Pete J. Dunn. Associate Editor, Dept. of Mineral Sciences, Smithsonian Institution, Washington, D. C. 20560.