NEW MINERAL NAMES*

MICHAEL FLEISCHER, LOUIS J. CABRI, GEORGE Y. CHAO AND ADOLF PABST

Apachite*, Gilalite*

F. P. Cesbron and S. A. Williams (1980) Apachite and gilalite, two new copper silicates from Christmas, Arizona. *Mineral. Mag., 43,* 639–641.

Both new species are retrograde or mesogene minerals that occur in tactites at the Christmas mine, Gila County, Arizona.

For apachite the average of two closely agreeing analyses gave: CuO 43.6, FeO 0.3, MgO 1.7, CaO 1.8, SiO_2 40.8, H_2O 13.8%, sum 102.0, close to $Cu_9Si_{10}O_{29} \cdot 11 H_2O$. Apachite is blue, H = 2, D = 2.80. Biaxial (−), 2V small, α = 1.610, β = γ = 1.650. No single crystals were found, but the powder pattern was indexed on a monoclinic cell with a = 12.89, b = 6.055, c = 19.11Å, β = 90.42°; strongest lines of the powder pattern are 13.49(10)(100), 7.663 (7)(102), 3.168(7)(401).

For gilalite the average of two closely agreeing analyses gave: CuO 36.2, MgO 2.3, CaO 3.8, MnO 0.5, SiO_2 41.5, H_2O 14.6, sum 98.8, close to $Cu_5Si_6O_{17} \cdot 7H_2O$. Gilalite is green, H = 2, D = 2.72. Biaxial (−), 2V small, α = 1.560, β = γ = 1.635. No single crystals were found but the powder pattern was indexed on a monoclinic cell with a = 13.38, b = 19.16, c = 9.026Å, β sensibly 90°; optics indicate the lower symmetry. Strongest lines of the powder pattern are 13.4(10)(100), 10.97(5)(110), 7.786(5)(120).

DTA shows a sharp loss of water at about 92°C for gilalite and a smooth loss curve for apachite. A. P.

Cadmium

B. V. Oleinikov, A. V. Okrugin and N. V. Leskova (1979) Native cadmium in traps of the Siberian Platform. *Doklady Akad. Nauk SSSR, 248,* 1426–1428 (in Russian).

Native cadmium is reported from the heavy, non-magnetic fraction of a concentrate from gabbro-dolerite of the Ust'-Khannin intrusive, eastern Siberian Platform, basin of the Vilui River. It was found as flattened grains, max. size 0.2mm, with smooth surfaces. Color tin-white with a bluish tint, luster metallic, malleable, diamagnetic. Probe analysis gave Cd 99–100% with no Zn or Sn. X-ray powder data are given (9 lines); the strongest lines are 2.79(3), 2.55(4), 2.331(10). These are slightly smaller than the lines given in JCPDS 5-0674. Unit-cell data are not given. Cadmium is hexagonal, $P6_3/mmc$, a = 2.979, c = 5.617Å.

Associated minerals listed include moissanite, native Fe, Cu, Pb, Sn, Zn, Al [*Am. Mineral., 65,* (1980)], alloys of Cu with Zn, and Sn with Sb, garnet, spinel, kyanite, corundum, rutile, and sulfides of Fe, Cu, Pb, Sb, Zn, As, Hg.

Discussion

No data are given on methods of separation or treatment. The assemblage seems highly improbable, but more data are needed. M. F.

Chukhrovite-(Ce), Rhabdophane-(Ce)

Kurt Walenta (1978) Chukhrovite-(Ce) and rhabdophane-(Ce) from the Clara Mine at Oberwolfach, Middle Black Forest. *Chem. der Erde, 38,* 331–339 (in German).

Chukhrovite-(Ce) occurs in white crystals up to a few mm on fluorite. X-ray data show it to be cubic with a = 16.80±0.005Å (surprisingly, somewhat higher than for chukhrovite). Isotropic, n = 1.443±0.002. The strongest X-ray lines (55 given) are 9.75(10)(111), 5.93(8)(220), 4.20(5)(400), 3.22(7)(333,511), 2.56(6)(633), 2.24(5)(642), 217(6)(731,553), 1.824(5)(842). No analysis is given. Electron microprobe analysis showed that Ce is dominant, Nd next, with La, Pr, Sm, Gd, and Eu present.

Rhabdophane-(Ce) occurs in white to pale brown crystals, aggregates of subparallel needles occurring in druses on barite, fluorite, chalcopyrite, and tetrahedrite. Optically uniaxial, positive, ω = 1.688, ϵ = 1.744 (both ±0.003) [both 0.03 higher than usually given for rhabdophane-(La)]. No analysis is given, but electron microprobe study showed Ce dominant, followed by Nd, La, Pr, Gd, Sm, Er, and Eu. X-ray powder data are given (28 lines); the strongest lines are 6.09(9)(10$\bar{1}$0), 4.41(8)(10$\bar{1}$1), 3.51(7)(11$\bar{2}$0), 3.03(10)(20$\bar{2}$0), 2.83(9)(2.83(10$\bar{1}$2), corresponding to a = 7.01, c = 6.40Å, close to those for rhabdophane-(La).

Discussion

May be accepted provisionally. Nothing whatever is said of the presence or absence of Y in either mineral; previous analyses of chukhrovite are of chukhrovite-(Y), so the omission is a serious one. M. F.

Comblainite*

Paul Piret and Michel Deliens (1980) Comblainite, (Ni_x^{2+}, Co_{1-x}^{3+}) $(OH)_2(CO_3)_{(1-x)/2} \cdot yH_2O$, a new mineral of the pyroaurite group. *Bull. Mineral., 103,* 113–117 (in French).

Electron microprobe analyses were made of 2 samples, giving Co_2O_3 20.80, 20.20; NiO 39.30, 38.40; UO_3 4.24, 5.20; MgO (calc.) 0.30, 0.37; P_2O_5 (calc.) 1.05, 1.29; H_2O (calc.) 1.07, 1.31, H_2O– 11.59, 8.69; (H_2O+ + CO_2) 21.29, 20.96, sum 99.64, 96.42%. MgO, P_2O_5, and H_2O calc. were calculated from UO_3, known to be present as metasaleeite. TGA determinations (giving CO_2, H_2O+, H_2O–, plus oxygen corresponding to $Co_2O_3 \rightarrow 2CoO$) gave 35.95, 32.79%, respectively. The valences of Ni and Co were determined by ESCA spectra. The infrared spectrum shows bands for H_2O,

$OH-$, and $(CO_3)^{-2}$. The thermogravimetric curves show losses to 175° of 12.66 and 10.00% (molecular H_2O); the hydroxyl and CO_2 are given off 250–340°. Inflections at 480° and 710° correspond to the changes Co_2O_3 to Co_3O_4 and Co_3O_4 to CoO. The analyses give, respectively, $Ni_{6.10}^{2+}Co_{2.90}^{3+}(CO_3)_{1.315}(OH)_{18.27} \cdot 6.7\ H_2O$, and $Ni_{6.11}^{2+}Co_{2.89}^{3+}(CO_3)_{1.02}(OH)_{18.84} \cdot 9.92\ H_2O$.

The mineral is rhombohedral, $a = 7.796$Å, $\alpha = 22.47°$, $Z = 1$; in hexagonal setting $a = 3.038$, $c = 22.79$Å, space group $R\bar{3}m$, $R3m$, $R\bar{3}$, $R3$, or $R32$, D calc. for the 2 formulas above 3.16, 3.31, meas. 3.05±0.02. The strongest X-ray lines (16 given) are 7.64(100)(003), 3.808(50)(006), 2.567(70)(012), 2.778(50)(015), 1.934(40)(018). The mineral is a member of the hydrotalcite group.

The mineral occurs as turquoise-blue cryptocrystalline crusts on altered uraninite from Shinkolobwe, Zaire, associated with becquerelite, curite, rutherfordine, and heterogenite. Under the microscope, it is yellow-green, non-pleochroic, with $\omega' = 1.690$, $\epsilon' = 1.684$ (both ±0.002).

The name is for Gordon Comblain, of the Musee Royal de l'Afrique Central, Tervuren, Belgium, who discovered the mineral. Type material is at that museum. **M. F.**

Defernite*

Halil Sarp, M. F. Taner, Jacques Deferne, Helene Bizouard and B. W. Liebich (1980) Defernite, $Ca_6(CO_3)_2(OH,Cl)_8 \cdot nH_2O$, a new calcium chloro-hydroxyl carbonate. *Bull. Mineral., 103,* 185–189 (in French).

Electron microprobe analysis (average of 18 analyses on 3 samples) gave CaO 62.9, SiO_2 1.2, CO_2 13.4, Cl 3.3, total 80.8 − (O = Cl_2) 0.74 = 80.06, H_2O 19.94% by difference, corresponding to $Ca_{5.62}(CO_3)_{1.52}(SiO_4)_{0.1}(OH)_{7.32}Cl_{0.47} \cdot 1.87\ H_2O$, or $Ca_6(CO_3)_2(OH,Cl)_8 \cdot 2H_2O$, or $Ca_3(CO_3)(OH,Cl)_4 \cdot H_2O$, for which $Z = 8$. Dissolved by cold HCl with effervescence.

Weissenberg and precession study show defernite to be orthorhombic, space group $Pna2_1$ or $Pnam$, $a = 17.860$, $b = 22.775$, $c = 3.658$Å, D calc. 2.42, meas. 2.5. The strongest X-ray lines (30 given) are 11.37(100)(020); 8.29(35)(210); 5.68(30)(040); 3.045(40)(270,141); 2.899(50)(460); 2.418(35)(531,730); 1.962(35); 1.825(40).

The mineral occurs in fan-shaped forms 100–200 microns in size. Colorless, luster vitreous. Cleavage {010} perfect, {100} distinct. Forms {001}, {100}, {010}, {101}, {201}. Optically biaxial, neg., $\alpha = 1.546$, $\beta = 1.572$, $\gamma = 1.576$ (all ±0.001), 2V = 42°; dispersion $r < v$, medium; $X = c$, $Y = b$.

The mineral occurs in skarn at the contact of granite with Cretaceous limestone near Güneyce-Ikizere, Trabson region, Turkey. Associated minerals include vesuvianite, wollastonite, andradite, diopside, calcite, rustumite, spurrite, and hillebrandite.

The name is for Jacques Deferne, Curator of Mineralogy, Museum d'Histoire Naturelle, Geneva, Switzerland, where type material is deposited. **M. F.**

Fluckite*

Hubert Bari, Fabien Cesbron, Francois Permingeat and Francois Pillard (1980) Fluckite, hydrated calcium manganese arsenate, $CaMnH_2(AsO_4)_2 \cdot 2H_2O$, a new mineral. *Bull. Mineral., 103,* 122–128 (in French).

Michele Catti, Giacomo Chiari and Giovanni Ferraris (1980) Fluckite, $CaMn(HAsO_4)_2 \cdot 2H_2O$, a structure related by pseudo-

polytypism to krautite, $MnHAsO_4 \cdot H_2O$. *Bull. Mineral., 103,* 129–134.

Microprobe analyses of deep rose and pale rose varieties gave, respectively, As_2O_5 50.40, 50.49; CaO 13.01, 12.86; MnO 13.68, 16.65; FeO 0.11, 0.05; CoO 0.59, 0.03; NiO−, 0.03; MgO 0.93, −. Analysis of pale rose material by atomic absorption by B. Reynier on 80 mg gave As_2O_5 56.60, CaO 12.98, MnO 17.17, MgO 0.04, H_2O (Penfield) 13.20, sum 99.99%. Analysis by J. Hucherot on material from the Giftgrube gave As_2O_5 57.4, CaO 13.6, MnO 16.8, MgO 0.3, H_2O 13.3, sum 101.4%. All these lead to the formula $Ca(Mn,Mg,Co)(HAsO_4)_2 \cdot 2H_2O$. The DTA curve shows an endothermic break at 260° (dehydration).

The mineral is triclinic, $P\bar{1}$, $a = 8.459±0.002$, $b = 7.613±0.001$, $c = 6.98±0.001$Å, $\alpha = 82.21±0.01$, $\beta = 98.25±0.01$, $\gamma = 95.86±0.02°$; $Z = 2$; D calc. 3.11, measured 3.05±0.02. The strongest X-ray lines (36 given) are 8.323(44)(100), 7.512(100)(010), 3.767(56)($\bar{2}$10,020), 3.528(90)($\bar{1}$20,210), 3.266(91)(012), 2.975(81)(0$\bar{1}$2), 2.688(61)(220), 2.671(43)($\bar{3}$10).

The mineral is colorless to pale rose to deep rose. It occurs as radiating prismatic crystals with {100}, {110}, and {010} dominant and 6 other faces. Cleavages {010} perf., {100} easy, {$\bar{1}$01} difficult and imperfect. H = 3½–4. Optically biaxial, probably positive, 2V large, $\alpha' = 1.618$, $\gamma' = 1.642$.

The mineral was found at the 60 m. and 100 m. levels of the Gabe Gottes–Saint Jacques vein at Sainte Marie-aux-Mines, Vosges, France, associated with pharmacolite and picropharmacolite. The name is for Pierre Fluck, mineralogist, Louis Pasteur University, Strasbourg. **M. F.**

Giniite*

Paul Keller (1980) Giniite, $Fe^{+2}Fe_4^{+3}(H_2O)_2(OH)_2(PO_4)_4$, a new mineral from the pegmatite of Sandamab near Usakos, Namibia. *Neues Jahrb. Mineral. Monatsh.,* 49–56 (in German).

Microprobe analysis (H_2O by GA), using analyzed wyllieite as standard, gave P_2O_5 36.99, Fe_2O_3 (total Fe) 46.07, Al_2O_3 1.20, MgO 0.68, MnO 0.63, H_2O 6.45, sum 92.02%. The pleochroism and blue-green color indicate the presence of both Fe^{2+} and Fe^{3+}; the molecular weight from the unit cell dimensions suggests the formula $Fe_x^{2+}Fe_{5-x}^{3+}(H_2O)_{1+x}(OH)_{3-x}(PO_4)_4$. Dehydration showed a loss of 4.0% to 330°, corresponding to $2H_2O$, and a further loss of 2.4% at 510°. The formula then becomes, with $x = 1$, $Fe^{2+}Fe_4^{3+}(PO_4)_4(OH)_2 \cdot 2H_2O$.

X-ray study showed giniite to be orthorhombic, space group $Cmm2$, $C222$, or $Cmmm$, $a = 10.365$, $b = 26.582$, $c = 5.162$Å, $Z = 4$, D calc. 3.42, meas. 3.41.

The strongest X-ray lines (22 given) are 3.36(10)(260,061), 3.20(7)(330,241), 2.80(5)(261,081), 2.28(6)(371,421), 2.04(7), 1.679(6), 1.604(7).

The mineral occurs in idiomorphic crystals with {010}, {150}, and {041} dominant, present also {310}, {001}, {100}. Crystals are up to 0.5×0.2×0.05mm. Color blackish-green to blackish-brown, streak olive, luster vitreous to greasy. No cleavage, fracture conchoidal; H 3–4. Optically biaxial neg. $2V \sim 55°$. $\alpha = 1.775$, $\beta = 1.803$, $\gamma = 1.812$; pleochroic, $X = c$, light brown, $y = b$, dark brown, $Z = a$, dark blue green.

The mineral occurs in pegmatite at Sandamab near Usakos, Namibia, associated with hureaulite, tavorite, leucophosphite, and an unknown phosphate, formed by the alteration of triphylite. The name is for the author's wife. **M. F.**

Helmutwinklerite*

Günter Schnorrer-Köhler (1980) Koritnigite and helmutwinklerite, two new minerals from Tsumeb, S. W. Africa. *Aufschluss, 31,* 43–49 (in German).

Microprobe analysis (H_2O by Karl Fischer method) gave (average): As_2O_5 34.35, PbO 31.28, ZnO 27.50, CuO 1.48, H_2O 6.14, sum 100.75%, corresponding to $Pb_{0.9}Cu_{0.12}Zn_{2.17}As_{1.92}O_8 \cdot 2.19H_2O$, or $PbZn_2(AsO_4)_2 \cdot 2H_2O$. Dissolved by cold concentrated HCl.

Triclinic, pseudo-monoclinic, $P1$ or $P\bar{1}$. Forms $\{001\}$, $\{010\}$, $\{1\bar{1}0\}$, and $\{11\bar{1}\}$. Color sky-blue. G = 5.3, H = 4½, α = 1.72(5), β = 1.80(5), γ = 1.98(5); biaxial positive. Luster vitreous to resinous. No cleavage. The mineral occurs in cavities in tennantite, associated with quartz and willemite.

The name is for Helmut Winkler, University of Göttingen. **M.F.**

Jungite*, Matulaite*

P. B. Moore and Jun Ito (1980) Jungite and matulaite, two new tabular phosphate minerals. *Aufschluss, 31,* 55–61 (in German).

Jungite

Analysis by J. I. gave P_2O_5 31.0, Al_2O_3 0.08, Fe_2O_3 28.4, ZnO 14.6, MgO 0.06, MnO 2.80, CaO 5.89, Na_2O 0.04, K_2O 0.01, H_2O- (180°C) 9.10, H_2O+ (loss on ign.) 8.70, sum 100.68%, corresponding to $Ca_2Zn_4Fe_8^{3+}(PO_4)_9(OH)_9 \cdot 16H_2O$.

X-ray data show it to be orthorhombic, possible space groups *Pcmm, Pcm2₁*, or *Pc2m*, a = 11.98, b = 20.37, c = 9.95Å, Z = 2. D calc. 2.849, meas. 2.843. The strongest lines (50 given) are 9.96(6)(10)(020), 5.09(5)(040), 3.79(4), 3.37(5)(060), 3.30(5).

The mineral occurs as rosettes up to 1 cm in diameter of very thin, tabular, bent crystals. H = 1. Cleavage perfect $\{010\}$. Color dark green, streak yellow. Luster silky to vitreous. Optically biaxial, neg.(?), β = 1.658, γ = 1.664, $2V \sim 60°$, $Y = a$, $Z = c$, $r < v$ strong. The mean n, calculated by the Gladstone–Dale rule, is stated (without comment) to be 1.703.

The mineral occurs at the Hagendorf South pegmatite, Bavaria, associated with mitridatite and manganese oxides. The name is for Dr. Gerhard Jung, who found the mineral.

Matulaite

Analysis of material from Hellertown gave P_2O_5 33.5, SiO_2 3.0, TiO_2 0.12, Al_2O_3 34.0, Fe_2O_3 1.05, ZnO 0.14, CuO 0.09, MnO 0.07, CaO 1.59, BaO 0.06, Na_2O 0.06, K_2O 0.04, H_2O- (140°C) 15.39, H_2O+ (loss on ign.) 10.64, sum 99.75%. After subtracting quartz and hematite, this gives $CaAl_{18}(PO_4)_{12}(OH)_{20} \cdot 28H_2O$. Difficultly soluble in HCl, easily in hot H_2SO_4.

Weissenberg and rotation photographs show matulaite to be monoclinic, space group probably $P2_1/c$, a = 20.4, b = 16.7, c = 10.6Å, β = 98.2°, Z = 2. The strongest X-ray lines (38 given) are 9.96(10), 6.37(4), 4.42(4), 2.395(4). A sample ground in acetone gave strongest lines 11.79(100), 10.93(90), 5.94(10), 5.51(80).

The mineral occurs in small rosettes of thin tabular crystals and botryoidal forms. Cleavage $\{100\}$ very perfect. Colorless to white, luster pearly. H = 1; D = 2.330. Optically biaxial, neg., $2V \sim 60°$, β = 1.576, γ = 1.582; dispersion $r < v$ strong, $Y = b$, $Z:c = 8°$. The mean index, calc. from the Gladstone–Dale rule, is stated to be 1.542.

The mineral occurs at the Bachman iron mine, Hellertown, Pennsylvania (type locality), and from the Rotläufchen iron mine, Waldgirmes, West Germany, at both of which it occurs as in-

crustations on chert, the youngest mineral of the association beraunite, rockbridgeite, dufrenite, cacoxenite, strengite, wavellite. Also occurs at the LCA pegmatite, Gaston Co., N. Carolina.

The name is for Mrs. Marge Matula of Allentown, Pa., who found the Hellertown material. **M.F.**

Kolwezite*

Michel Deliens and Paul Piret (1980) Kolwezite, an hydroxycarbonate of copper and cobalt, analogous to glaukosphaerite and rosasite. *Bull. Mineral., 103,* 179–184 (in French).

Analysis (Cu, Co by X-ray fluorescence, CO_2 volumetric, H_2O + CO_2 by TGA) gave CoO 22.98, CuO 48.40, CO_2 19.44, H_2O 8.78, sum 99.60%, corresponding to $(Cu_{1.33}Co_{0.67})(CO_3)_{0.98}(OH)_{2.07}$ or $(Cu,Co)_2(CO_3)(OH)_2$ with Cu:Co = nearly 2:1. The DTA curve showed a small endothermic break at 110°, a large one at 425°, (loss of CO_2), and a small one at 560°C (conversion of Co_2O_3 to Co_3O_4). The infrared absorption curve is very similar to that of rosasite and somewhat similar to that of glaukosphaerite.

X-ray powder data are given; they correspond to a triclinic cell with a = 9.50, b = 12.15, c = 3.189Å, α = 93.32°, β = 90.74°, γ = 91.47°, Z = 4. D 3.94 calc., 3.97 meas. The strongest lines (31 given) are 6.04(80)(020); 5.08(80)(120); 3.70(100)(220); 2.956(50)($1\bar{1}1$); 2.951(80)($2\bar{1}1$); 2.535(50)(211); 1.109(50).

The mineral occurs in the oxidized zone of the Cu–Co deposit of Kolwezi-Kamoto-Musonoi, southern Shaba, Zaire, as nodules (1–10 mm) and microcrystalline crusts. H near 4, color black to beige, α' = 1.688±0.002, $\gamma' > 1.90$.

The name is for the locality. Type material is at the Musee Royal Afrique Centrale, Tervuren, Belgium. **M.F.**

Kuramite*

V. A. Kovalenker, T. L. Evstigneeva, N. V. Troneva and L. N. Vyal'sov (1979) Kuramite, Cu_3SnS_4, a new mineral of the stannite group. *Zap. Vses. Mineral. Obsh., 108,* 564–569 (in Russian).

Microprobe analyses of 5 samples gave Cu 36.54, 36.74, 36.25, 36.70, 40.10; Fe 2.94, 2.39, 2.84, 2.21, 1.43; Zn 1.73, 2.17, 2.50, 2.10, 0.91; Sn 30.05, 30.92, 29.50, 31.77, 28.36; In 0.21, 0.31, 0.33, 0.24, 0.51; S 28.02, 27.65, 28.04, 27.86, 27.75, sum 99.50, 100.18, 99.46, 100.87, 99.06%. These correspond to $Cu_{2.00}(Cu,Fe,Zn)SnS_4$ with Cu 2.56–2.83, Fe 0.12–0.24, Zn 0.06–0.17, Sn 1.06–1.17, In 0.01–0.02, S 3.88–3.92. This is a member of the stannite $(Cu_2^+Fe^{2+}SnS_4)$–kesterite$(Cu_2^+Zn^{2+}SnS_4)$ series, the end member being $Cu_2^+Cu^{2+}SnS_4$.

Kuramite is tetragonal, space group $I\bar{4}2m$, a = 5.445±0.005, c = 10.75±0.02Å, Z = 2. The strongest X-ray lines (11 given) are 3.13(10)(112), 1.914(8)(024,220), 1.640(6)(132), 1.108(4)(244).

Under the microscope neutral gray. Distinctly anisotropic, with color effects in brown shades. Reflectivity (R_{max} and R'e): is given at 16 wave lengths, at 460nm, 25.3, 25.2; 540, 26.5, 28.7; 580, 26.7, 29.5; 640, 26.5, 28.0%. H (20g load) 379–432, av. 390 kg/sq mm on grains of analyses 1–4; 301–372, av 333 kg/sq mm on grain 5 (highest Cu content).

The mineral occurs in gold–sulfide–quartz ores in a deposit in the Kuramin Mts., eastern Uzbekistan, as inclusions 5–80 microns in diameter within goldfieldite, which also contains inclusions of hessite, petzite, sylvanite, altaite, native Au, and other minerals.

The name is for the locality. Type material is at the Mineralogical Museum, Academy of Sciences, and in the Institute of Ore Deposits, *etc.* (IGEM), both in Moscow. **M.F.**

Partheite*

Halil Sarp, Jacques Deferne, Helene Bizouard and B. W. Liebich (1979) Partheite, $CaAl_2Si_2O_8 \cdot 2H_2O$, a new natural silicate of aluminum and calcium. *Schweiz. Mineral. Petrog. Mitt., 59,* 5–13 (in French).

Electron microprobe analyses (standards, analyzed vuagnatite, wollastonite, albite, orthoclase) gave SiO_2 40.24, 38.83, 38.10; Al_2O_3 31.99, 30.46, 29.68; CaO 16.38, 16.31, 16.22; Na_2O 0.32, 0.32, 0.32; K_2O 0.23, 0.23, 0.23; H_2O 10.83, 13.85, 15.45%, corresponding to the formula above.

Weissenberg photographs show partheite to be monoclinic, space group probably $C2/c$, $a = 21.59$, $b = 8.78$, $c = 9.31Å$, $\beta = 91.47°$, $Z = 8$; D calc. 2.37, meas. 2.39. The strongest X-ray lines (36 given) are 10.79(100)(200), 8.12(80)(110), 6.10(70)(111), 3.740(50)(22$\bar{1}$), 3.600(40)(31$\bar{2}$,51$\bar{1}$), 3.190(40)(022).

Partheite occurs as white fibers of vitreous luster in rodingite of the Taurus Mts., S. W. Turkey. Associated minerals are prehnite, thomsonite, and augite. The mineral is optically biaxial, positive, $2V = 48°$, $\alpha = 1.547$, $\beta = 1.549$, $\gamma = 1.559$ (all ± 0.001); $r > v$ med., elongation negative, extinction 23–30°, $X\Lambda$ elongation; cleavage distinct parallel to fibers.

The name is for Edwin Parthé, Professor of Crystallography, University of Geneva. **M.F.**

Pianlinite

Liu Changling, Liu Deye, Zhang Fu, Li Jinsheng, Sun Weijun and Lu Wenhan (1963) Pianlinite, a new clay mineral species. *Kexue Tongbao,* 10, 59–62 (in Chinese). Liu Changling (1979) New data on pianlinite. *Kexue Tongbao,* 24, 553–555 (in Chinese).

Chemical analysis gave Al_2O_3 42.63, SiO_2 50.10, TiO_2 0.32, Fe_2O_3 0.10, FeO 0.50, CaO 0.06, MgO 0.09, K_2O 0.06, Na_2O 0.03, ZrO_2 0.008, MnO tr, P_2O_5 0.005, H_2O+ 4.55, H_2O- 1.63, sum 100.083, corresponding to $Al_2O_3 \cdot 2SiO_2 \cdot H_2O$.

The mineral is almost X-ray amorphous and gives many lines on long exposures. The X-ray pattern of the better crystallized variety is characterized by the lack of very intense lines and of low-angle lines. The strongest lines (30 given) are 4.62(3, diffuse), 3.37(3), 2.56(7), 2.42(5), 2.21(6), 1.53(4), 1.48(3), 1.27(5), 1.25(3), 0.967(3), 0.846(4). Powder patterns for materials heated to 950°, 1245°, and 1385°C are also given. Powder and single-crystal electron diffraction studies show the mineral to be neither amorphous nor crystalline (no details given, GYC). The mineral is considered to be "semi-crystalline" due to strong c-axis disorder as in meta-kaolinite. Diffractometer tracings of coarsely crushed material (1963) show a broad peak centered at 15° 2θ and two sharp peaks at 2.016 and 2.336Å, thought to be due to preferred orientation effect.

The mineral is pure white and grayish white with vitreous luster to gray and earthy. The mineral occurs as dense massive aggregates that are brittle, hard (6–7), with uneven to subconchoidal fracture. The true density is 2.45 g/cm³. In thin section, the aggregates are mostly phanerocrystalline, displaying colloform, myrmeketic (up to 2mm), petal-like, and fine to coarse scaly structures. The mineral is colorless. Some specimens are weakly pleochroic with X = colorless, Z = pale yellow. The mineral has a perfect (001) cleavage and shows straight extinction with the cleavage parallel to the vibration direction of the slow ray. $\alpha = 1.532(2)$, $\beta = 1.539(4)$, $\gamma = 1.541(4)$, $(\pm) 2V = 0°$ to 5° or less. Electron microscopy shows the crystals to be irregular to nearly hexagonal plates.

DTA curve shows endothermic peaks at 144° (weak and broad) and 892° (weak and may be absent) and exothermic peaks at 950° (sharp and strong, crystallization of Al–Si-spinel) and at 1245°C (weak, crystallization of mullite and cristobalite). TGA curve shows a small initial weight loss to 100°, followed by a slow one-stage major weight loss to 500°C.

The infrared spectrum of pianlinite is similar to that of meta-kaolinite heated to 900°C, except the presence of the O–H stretching band at $3100–3700^{-1}$ and the absence of fine structures in the $600–1400cm^{-1}$ region of the former.

The mineral occurs as a monomineralic clay bed (less than 1m in thickness) in an Upper Carboniferous sedimentary formation in Pianling, China. Accessory minerals in the clay bed are quartz, zircon, mica, rutile, augite, garnet, epidote, ilmenite, gibbsite, halloysite, kaolinite, and ferromontmorillonite. The name is for the locality.

Discussion

The data show the mineral to be unique. The non-crystalline nature and the thermal behavior of the mineral are similar to those of allophane but it may be distinguished from allophane by its lower water content and higher refractive indices and density. It may also be distinguished from the minerals of the kaolinite group by its lower water content and the characteristic absence of a well-defined endothermic reaction at 500°–700°C on its DTA curve. However, the sharp reflections of 2.016 and 2.336Å, observed on the diffractometer tracings of the nearly amorphous material, do not match the X-ray lines given for the better crystallized material, suggesting the presence of another phase. Further study of the mineral, especially on its homogeneity and the range of composition variations, is desirable. The mineral should not have been given a name at the present stage (see Bailey, *Can. Mineral., 18,* 143–150, 1980). **G.Y.C.**

Ruarsite

Tsu-hsiang Yu and Hsueh-tsi Chou (1979) Ruarsite, a new mineral. *Science Bulletin (Ko'Hsueh Tu'ng Pao),* 24, 310–316 (in Chinese).

Ruarsite is reported as a new mineral found in heavy mineral concentrates from and in polished sections of chromium ore from an Alpine-type ultramafic, northern Tibet, as well as in placers derived from the weathered ultramafics. Eight probe analyses for seven grains gave Ru 42.45 (35.74–49.84), Os 5.94 (nil to 14.84), Ir 1.67 (nil to 2.8), Pt 0.07 (nil to 0.32), Cu 0.00 (nil to 0.01), As 36.25 (33.09–39.2), Sb 0.00 (nil to 0.01), and S 14.08 (13.7–15.0); sum 100.36 (98.3–102.3), corresponding to an average of $(Ru_{0.913}Os_{0.048}Ir_{0.018}Pt_{0.001})As_{1.050}S_{0.934}$ or, ideally, RuAsS. An X-ray powder pattern (43 lines, plus 7 lines ascribed to laurite and irarsite) of a ruarsite grain, of composition $(Ru_{0.804}Os_{0.168}Ir_{0.025}Pt_{0.003})As_{1.004}S_{0.981}$, was indexed as monoclinic, $a = 5.931$, $b = 5.915$, $c = 6.003Å$, $\beta = 112°27'$ which corresponds with data for synthetic RuAsS (Hulliger, *Nature, 201,* 381–382, 1964). The strongest lines are: 3.79(50)($\bar{1}$11), 2.77(100)(002), 2.74(200), 1.890(70)($\bar{3}$02), 1.870(90)($\bar{3}$11), 1.695(90)(131) 1.660(60)(202), 1.580(50)(103) and 1.149(50)(340).

Ruarsite occurs as irregular grains or as aggregates (100–150 μm). It is lead-grey to dark-lead grey with a metallic lustre and a rough-textured surface. The streak is greyish black; it is brittle, non-magnetic and is not soluble in 1:1 HCl. In polished sections it is greyish white, pale yellow next to irarsite or laurite. The mineral

polishes reasonably well, better than irarsite and laurite. It is bire-flectant, in oil; pleochroism varies from pale yellowish white to light greyish yellow-white. The mineral is distinctly anisotropic; with nicols 1–2° off 90° bluish grey to light-reddish. Reflectance on a grain with minor Os gave: 42.0, 43.0, 42.5 (480 nm), 42.6, 43.8, 42.73 (546 nm), 42.9, 43.3, 42.6 (589 nm), and 43.4, 44.3, 43.3 (656 nm), and on a grain with 14% Os: 43.4 (480 nm), 44.1 (546 nm), 43.8 (589 nm) and 45.1 (656 nm). VHN_{20} = 982.1–1030.2 for two low-Os grains while the grain with 14% Os gave VHN_{20} = 804, VHN_{50} = 893, and VHN_{100} = 734. Internal reflection, cleavage and twinning were not observed. In the Cr-ore associated platinum-group minerals are iridosmine, ruthenian iridosmine (= rutheniridosmine?), sperrylite, and laurite; the latter occurs as relics in ruarsite. The principal metallic minerals of the ore are Cr-spinel (85–95%) with minor pyrite, pyrrhotite, loellingite, magnetite, chalcopyrite, molybdenite, galena, and millerite found in the interstices of the Cr-spinel. Principal gangue minerals are serpentine with minor chlorite. In the placer deposits, which occur on the western part of the ultramafic, the major PGM are Os–Ir–Ru alloys, such as ruthenosmiridium (or osmiridium?), iridosmine, (Pt,Ir) alloy, (Ru,Fe) alloy, osmium, gold, trace amounts of sperrylite, and the heavy minerals chromite, magnetite, ilmenite, rutile and garnet. The ruarsite occurs on the peripheries of some Os–Ir minerals, closely associated with PG-sulfide, -sulfarsenide or -arsenides which occur as exsolutions in the Os–Ir–Ru alloys as well as inclusions in sperrylite and replacing irarsite and laurite. In addition to ruarsite, ruthenarsenite, irarsite, platinian irarsite, iridarsenite, and anduoite (*Am. Mineral., 64*, 464, 1979) occur with these sulfarsenides and sulfides.

The mineral is named after its composition, as were osarsite and irarsite. Type specimens of ruarsite are deposited in the Museum of Geology.

Discussion

A very complete description of a new mineral species. **L.J.C.**

Schlossmacherite*

K. Schmetzer and H. Bank (1979) Schlossmacherite, a new mineral, named for Prof. Dr. Karl Schlossmacher, honorary president of the German Gemmological Society. *Z. deutsch. gemmol. Ges., 28,* 131–133 (in German).

A preliminary report. Analysis gave SO_3 29.3, As_2O_5 13.4, Al_2O_3 36.3, Fe_2O_3 0.6, CaO 3.5, SrO 0.3, BaO 0.3, K_2O 0.5, Na_2O 0.5, $H_2O\sim15$, sum 100.9%, corresponding to the formula $(H_3O,Ca)Al_3(SO_4,AsO_4)_2(OH)_6$ with $H_3O>Ca$ and $SO_4>AsO_4$. It is a member of the beudantite group.

The mineral is hexagonal, [trig(?)MF], a = 6.998, c = 16.67Å; strongest X-ray lines 4.92(70), 2.98(50), 2.96(100). Av. n = 1.597.

The mineral occurs with ceruleite and chenevixite at the Emma Luisa mine, Guanaco, Chile. **M.F.**

Silver-4H, Silver-2H, Silver-3C

M. I. Novgorodova, A. I. Gorshkov and A. V. Molkhov (1979) Native silver and its new structural modifications. *Zap. Vses. Mineral. Obsh., 108,* 552–563 (in Russian).

Electron diffraction patterns of native silver from northeastern USSR showed, in addition to cubic silver, a = 4.08Å, the presence

of two hexagonal forms, Ag-4H (a = 2.94, 2.93, 2.88; c = 10.11, 10.18, 9.62Å; D calc. = 9.53) and Ag-2H (a = 2.94, 2.93, 2.92; c = 4.80, 4.79, 4.774; D calc. = 10.11). X-ray powder data are given. Microprobe analyses of 6 samples by A. I. Tsepin showed Ag 98.21–99.93, Au 0.04–0.33, Sb 0.04–0.37, Bi 0.18–0.26, Cu up to 0.50, and traces of Fe, Cr, and Ni. **M.F.**

Sinjarite*

Z. A. Aljubouri and S. M. Aldabbagh (1980) Sinjarite, a new mineral from Iraq. *Mineral. Mag., 43,* 643–645.

A hygroscopic, soft, pink mineral was discovered in the dry bed of an intermittent stream in Sinjar town, west of Mosul city. Wet-chemical analysis gave Ca 25.84, Cl 46.64, H_2O 26.55, Na 0.85%, sum 99.88; trace elements K 226 ppm, Mg 5 ppm, Sr 141 ppm, Fe 9 ppm. The X-ray powder pattern agrees well with that recorded for $CaCl_2 \cdot 2H_2O$ (JCPDS card 1-0989). The mineral is granular (massive), white streak, vitreous to resinous luster; H = 1½. Elongated prismatic crystals have parallel extinction and positive elongation, n = 1.54.

It may be assumed that sinjarite has been precipitated within recent sediments from the slow evaporation of ground water saturated with Ca and Cl ions. The mineral is ephemeral, and dissolves quickly during wet seasons. Alternatively, because of its hygroscopic nature it may change to the hexahydrate $CaCl_2 \cdot 6H_2O$, which melts at 30°C and will not survive hot seasons. **A.P.**

Tarnowskite (= Tarnowitzite)

Maria Czaja (1978) New data on tarnowskite (tarnowitzite) from Tarnowskie Gory. *Mineral. Polonica, 9,* 89–96.

Tarnowitzite was named by Breithaupt for the locality in Upper Silesia. The Polish name is Tarnowskie Gory. Electron microprobe analyses showed Pb 2.93–4.60%; X-ray and infrared data are given.
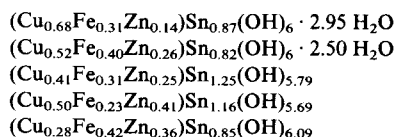
Discussion

Unnecessary name for plumboan aragonite. **M.F.**

Unnamed analogue of schoenfliesite

N. K. Marshukova, G. A. Sidorenko and N. I. Chistyakova (1978) On natural hydrostannates. *New Data on Minerals of the U.S.S.R., 27,* 89–95 (in Russian).

The Mushiston tin deposit, Central Asia, contains stannite–chalcopyrite–sphalerite–galena mineralization. The stannite has been altered to fine-grained earthy aggregates of brownish-green color. X-ray study showed the mineral to be cubic, a = 7.71±0.02Å. The strongest lines (17 given) are 3.840(10)(200), 2.719(8)(220), 1.722(6)(420). Microprobe analyses of 5 grains gave the formulas:

$(Cu_{0.68}Fe_{0.31}Zn_{0.14})Sn_{0.87}(OH)_6 \cdot 2.95\ H_2O$
$(Cu_{0.52}Fe_{0.40}Zn_{0.26})Sn_{0.82}(OH)_6 \cdot 2.50\ H_2O$
$(Cu_{0.41}Fe_{0.31}Zn_{0.25})Sn_{1.25}(OH)_{5.79}$
$(Cu_{0.50}Fe_{0.23}Zn_{0.41})Sn_{1.16}(OH)_{5.69}$
$(Cu_{0.28}Fe_{0.42}Zn_{0.36})Sn_{0.85}(OH)_{6.09}$

Discussion

Note that the first four of these have Cu dominant; the last has Fe dominant. Material with Fe dominant had previously been described by Grubb and Hannaford, *Mineralium Deposita, 2,* 148–171(1966) and by Geier and Ottemann, abstract in *Am. Mineral., 56,* 1488 (1971). **M.F.**

Unnamed chlorite

F. Radke, P. K. Schultz, and R. N. Brown (1978) Zinc-rich chlorite from Chillagoe, Queensland. *Amdel Bull., no. 23,* 25–28.

Drill cores in chloritized andesites and skarns have veins with calcite, quartz, and fibrous green chlorite. Analyses show ZnO 6.0–30.5%. Microprobe analysis by P.K.S. gave SiO_2 32.0, Al_2O_3 12.4, FeO (total Fe) 12.9, ZnO 30.5, MgO 4.6, MnO 0.15, CaO 1.0, sum 93.5%, corresponding to $(Zn_{2.47}Fe_{1.14}Mg_{0.71}Ca_{0.11}Mn_{0.01}Al_{0.19})Al(Si_{3.52}Al_{0.48})O_{10}(OH)_8$. The strongest X-ray lines (9 given) are 14.2(8), 7.15(10), 3.57(4), 2.66(3), 1.54(4). The mineral had $\alpha = 1.582$, $\gamma = 1.614$. **M.F.**

Unnamed Na_2HPO_4, unnamed $Na_2HPO_4 \cdot 2H_2O$

A. P. Khomyakov and Yu. P. Men'shikov (1979) Identification of Na_2HPO_4 and $Na_2HPO_4 \cdot 2H_2O$ in the products of alteration of natural natrophosphate. *Dokl. Akad. Nauk SSSR, 248,* 1207–1211 (in Russian).

Natrophosphate was described [see *Am. Mineral., 58,* 139 (1973)] as $Na_6H(PO_4)_2F \cdot 17H_2O$, and is here stated to be $Na_7(PO_4)_2F \cdot 19H_2O$. Material from Mt. Karnasurt, Lovozero massif, and from Yukspor and Koashva, Khibina massif, is altered to dense, porcelain-like, or friable powdery aggregates of snow-white color, with dull luster. X-ray powder data show that these consist of mixtures of villiaumite (NaF), Na_2HPO_4 (ASTM 10-184), and $Na_2HPO_4 \cdot 2H_2O$ (ASTM 1-0232). **M.F.**

Unnamed V mineral of the montmorillonite group

M. Güven and W. F. Hower (1979) A vanadium smectite. *Clay Minerals, 14,* 241–245.

Analysis of material saturated with Na, then dried to constant weight at 105°C, gave Si 18.78, V 20.90, Al 2.52, Mg 0.93, Fe 0.92, Ca 0.62, Na 3.09%. This can be calculated as V^{3+} and Fe^{2+} or as V^{4+} and Fe^{3+} respectively, giving SiO_2 40.18, V_2O_3 30.75 or V_2O_4 34.03, Al_2O_3 4.76, MgO 1.54, FeO 1.18 or Fe_2O_3 1.32, CaO 0.87, Na_2O 4.26, loss on ign. 14.92, sum 98.46 or 101.88%.

The X-ray diffraction pattern of the oriented <2 micron fraction shows a very strong reflection 15.0±0.1Å. The material saturated with Na has a basal spacing of 12.6±0.1Å, which expands to 16.7±0.1Å on saturation with glycol. Randomly oriented powder indicated $b = 9.02±0.2$Å. SEM photographs are given. **M.F.**

NEW DATA

Metavivianite = partly oxidized vivianite (?)

Jean-Francois Poullen (1979) New data on vivianite and metavivianite. *C. R. Acad. Sci. (Paris), 289D,* 51–52 (in French).

Metavivianite was described in *Am. Mineral., 59,* 896–899 (1974) as the triclinic dimorph of monoclinic vivianite. The present note, without giving any data, states that powder data, single-crystal study, and infrared study of metavivianite from the Yukon show that they are identical with those of naturally or artifically oxidized vivianite.

Discussion

Since Poullen did not examine type metavivianite from South Dakota, his conclusions have no standing. **M.F.**

DISCREDITED MINERALS

Hydrophilite

M. H. Hey (1980) What was hydrophilite? *Mineral. Mag., 43,* 682.

Hydrophilite was described by J. F. L. Hausmann (*Handb. Mineral.,* 875, 1813), as a coating on gypsum from the Lüneburg boracite deposit. He reported its constitutents to be calcium chloride and water, and that it is hygroscopic, deliquescent, very soluble in water, soluble in alcohol, and has an intensely bitter taste. Hydrophilite was evidently one of several hydrates of $CaCl_2$, and may have been an early find of antarcticite ($6H_2O$) or sinjarite ($2H_2O$), but remains undefined. **A.P.**

Slavyanskite = Tunisite

A. S. Povarennykh (1979) Slavyanskite. *Mineralog. Zhurnal, 1,* no. 2, 105–106 (in Russian).

Slavyanskite, described as $CaAl_2O_4 \cdot 8-8\frac{1}{4}H_2O$ (*Am. Mineral., 63,* 599, 1978) is shown by infrared spectrum to be a carbonate. Its X-ray and optical data correspond closely to those of tunisite (*Am. Mineral., 54,* 1–13, 1969), described as $HNaCa_2Al_4(CO_3)_4(OH)_{10}$. In a footnote, Povarennykh states, without giving his evidence, that the correct formula for tunisite is $CaAl_2(CO_3)_2(OH)_4$. **M.F.**