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# NEW MINERAL NAMES*

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## Argutite*
## Carboirite*

Z. Johan, E. Oudin and P. Picot (1983) Germanium and gallium analogues of silicates and oxides found in the zinc deposits of central Pyrenees, France; argutite and carboirite, two new mineral species. Tschermaks Min. Petrogr. Mitt., 31, 97–119 (in French).

### *Argutite*

The average of seven electron microprobe analyses yielded $GeO_2$ 95.82, $MnO_2$ 0.17, FeO 1.20, ZnO 3.03, sum 100.22. This gives the formula $(Ge_{0.942}, Mn_{0.002}, Fe_{0.018}, Zn_{0.038})_{\Sigma 1}O_{1.944}$ or ideally $GeO_2$.

No X-ray studies were possible due to the small grain size.

Argutite occurs in sphalerite as 10 μm euhedral to subhedral prismatic crystals with a predominance of {111}, {100}, and {101} forms. It is also associated with cassiterite, siderite and rarely with briartite. Optically, argutite is similar to cassiterite with a light grey reflectance and a distinct anisotropy. The reflectances are; nm (%) 420(13.7), 460(11.6), 500(11.0), 540(10.97), 580(10.93), 620(10.92), 660(10.93), 700(11.0), 740(11.1), 780(11.3).

The name is for the locality, the Argut Plane.

### *Carboirite*

The eight electron microprobe analyses show a partial miscibility between carboirite and chloritoid. Three analyses showing a wide variation are; $GeO_2$ 28.47, 18.44, 30.43, $SiO_2$ 3.86, 10.66, 2.70, $Al_2O_3$ 28.01, 38.21, 34.93, $Ga_2O_3$ 12.85, 0.10, 0.13, $V_2O_3$ n.a., 0.57, 0.00, FeO 21.92, 22.70, 24.08, MnO 0.27, 1.06, 0.65, MgO 0.00, 0.42, 0.00, ZnO 0.11, 2.09, 2.19, $H_2O$ (calc.) 6.04, 6.63, 6.22, sum 101.53, 100.88, 101.33. The ideal formula is $Fe^{2+}Al_2GeO_5(OH)_2$.

X-ray studies show it to be triclinic, space group $C\bar{1}$ (for comparison with monoclinic chloritoid), $a = 9.513$, $b = 5.569$, $c = 9.296$Å, $\alpha = 96.08$, $\beta = 101.52$, $\gamma = 89.45°$, Z = 4, D calc. = 3.95 (for Ge/(Ge+Si) = 0.75). The strongest X-ray lines (20 given) are 4.785(5) ($\bar{1}10$), 4.528(10)(002), 3.020(8)(003), 2.728(9) ($0\bar{2}1$), 2.480(9)($0\bar{2}\bar{2}$), 1.854(6)($\bar{3}14$), 1.608(7) ($\bar{3}\bar{3}1$), 1.384(6)(040).

Carboirite occurs as green, pseudo-hexagonal plates (100 × 100 × 30 μm) with crystal forms {001}, {110}, {010} and a (001) cleavage. It has a vitreous luster and H ~ 6. It is found in sphalerite, often associated with Ge-bearing quartz. Optically biaxial positive, *ns* $\alpha = 1.731$, $\beta = 1.735$, $\gamma = 1.740$, $2V = 7°$. Pleochroism; $X$ = bluish green, $Y$ = light blue, $Z$ = colorless to yellow.

The name is for the locality, the Carboire deposit on the Marimana Dome. **J.D.G.**

## Chessexite*

H. Sarp and J. Deferne (1982) Chessexite, a new mineral. Schweiz. Mineral. Petrogr. Mitt., 62, 337–341 (in French).

Analysis by atomic absorption (Na and K by flame photometry, S by chromatography, and $H_2O$ by TGA) gave $SO_3$ 31.91, $SiO_2$ 3.64, $Al_2O_3$ 15.30, MgO 3.50, ZnO 3.73, CaO 3.92, $Na_2O$ 4.44, $K_2O$ 0.30, $H_2O$ 31.11, sum 97.85. This gives the formula $(Na_{3.75}, K_{0.17}, Ca_{0.08})$ $(Ca_{1.75}, Mg_{0.25})$ $(Mg_{1.87}, Zn_{1.20})$ $(Al_{7.85}, Mg_{0.15})$ $(Si_{1.58}, S_{10.42})_{\Sigma 12}O_{53.46} \cdot 45.13\ H_2O$ or ideally $(Na,K)_4Ca_2(Mg,Zn)_3Al_8(SiO_4)_2(SO_4)_{10}(OH)_{10} \cdot 40H_2O$.

X-ray study shows the mineral to be orthorhombic, $a = 13.70$, $b = 27.96$, $c = 9.99$Å, D calc. 2.21, Z = 2. The strongest X-ray lines (32 given) are 13.91(100) (020), 4.85(90) (231), 3.982(60) (070,212,321,251), 3.451(40)(270), 3.422(100) (400,062,410), 3.322(40) (003,420), 2.908(30) (450,191), 2.161(30) (324,254).

The mineral occurs as white, thin (0.003 mm), square or rectangular plates (maximum 0.03 mm), with a silky luster. It was found as a coating on fluorite which is the ore mineral at the Maine mine, near Autun, France. Optically biaxial, positive, parallel extinction, *ns* $\alpha = 1.456$, $\beta = 1.460$, $\gamma = 1.480$, $2V = 47°$, $X = a$, $Y = c$.

The name is for Ronald Chessex, University of Geneva. Type material is at the Muséum d'Histoire Naturelle de Geneva. **J.D.G.**

## Fergusonite-Beta-(Nd)

Sun Weijun, Ma Fengjun and Zhuang Shijie (1983) Fergusonite-beta-Nd. Scientia Geologica Sinica, 78–81 (in Chinese with English abstract).

Electron microprobe analysis gave $La_2O_3$ 2.05, $Ce_2O_3$ 14.62, $Pr_2O_3$ 4.28, $Nd_2O_3$ 21.25, $Sm_2O_3$ 4.53, $Eu_2O_3$ 0.21, $Gd_2O_3$ 1.37, $Tb_2O_3$ 0.71, $Dy_2O_3$ 0.98, $Ho_2O_3$ 0.56, $Er_2O_3$ 0.51, $Tm_2O_3$ 0.36, $Yb_2O_3$ 0.45, $Lu_2O_3$ 0.29, $Y_2O_3$ 2.83, $Nb_2O_5$ 41.00, $Ta_2O_5$ 0.11, $ThO_2$ 1.09, $UO_2$ 1.46, $TiO_2$ 0.17, MnO 0.30, FeO 0.27, CaO 0.29, $ZrO_2$ 0.19, MgO 0.07, $Al_2O_3$ 0.12, $SiO_2$ 0.29, sum 100.36%. The analysis corresponds to $(Nd_{0.38}Ce_{0.27}La_{0.04}Pr_{0.08}Sm_{0.08}Gd_{0.02}Tb_{0.01}\,Dy_{0.02}\,Ho_{0.01}\,Er_{0.01}\,Tm_{0.01}\,Yb_{0.01}\,Y_{0.08})_{\Sigma = 1.02}(U, Th, Ca, Fe)_{0.06}\,(Nb, Ta, Ti)_{0.96}O_4$ or ideally $(Nd,Ce)NbO_4$.

The mineral is essentially metamict. Precession and Weissenberg photographs of heat-treated specimens were poor but showed the mineral to be monoclinic with $a = 5.07$, $b = 5.62$, $c = 5.41$Å, $\beta = 93.0°$. Long-exposure X-ray powder photographs of untreated material gave: 3.2064(10), 3.0253(10), 2.7976(5), 2.6961(5), 2.0648(5), 1.9549(5), 1.8832(9), 1.6691(5), 1.6024(5).

Infrared spectra of the mineral showed absorption bands at 1452(s), 1094(s), 1020(m), 878(s), 614(w), and 466 $cm^{-1}$(m).

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* 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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The mineral is brownish-red, red, yellowish-brown or yellowish-red with pale brown streak and vitreous to greasy luster. The mineral has subconchoidal fractures and no cleavage. Magnetic susceptibility is moderate (0.3–0.6Å). Under normal lighting the mineral appears to be isotropic, but in bright light some grains are weakly anisotropic, n = 2.0. After heating to 1000°C the mineral becomes yellowish green and shows more distinct interference colors.

The mineral occurs as irregular grains and rarely prismatic and bipyramidal, (0.02–0.06 mm, max. 0.25 mm) in a niobium-rare earth deposit in a proterozoic riebeckitized dolomite at Bayan Obo, Inner Mongolia, China. The associated minerals are riebeckite, ferroan dolomite, biotite, magnetite, monazite, bastnaesite, aeschynite-(Nd), ilmenite, pyrite, fergusonite-(Ce) and fergusonite-(Nd). **G.Y.C.**

## Gortdrumite*

Steed, G. M. (1983) Gortdrumite, a new sulphide mineral containing copper and mercury, from Ireland. Min. Mag., 47, 35–36.

Electron microprobe analyses of four grains in two polished sections averaged: Hg 41.55, Cu 38.68, Fe 2.07, S 16.81, sum 99.11%, yielding the empirical formula $(Cu,Fe)_6Hg_2S_5$.

X-ray powder data were indexed using an orthorhombic cell with $a$ = 14.958, $b$ = 7.900, and $c$ = 24.10Å, suggesting unit cell contents of $4[Cu_{18}FeHg_6S_{16}]$. The strongest lines (22 given) are: 6.03(40)(112,004), 4.58(100)(302,105), 3.38(70)(410,403), 2.88(50)(323), 2.78(50)(511).

Grains less than 200 μm × 50 μm are isolated in dolomite or intergrown with bornite in samples from a cinnabar-bearing ferroan dolomite–barite vein in the Gortdrum ore body of County Tipperary, Ireland. The grains are strongly anisotropic from grey-white to blue and many show lamellar twinning. The reflectivity at 589 nm is 25.1–27.9% and $VHN_{10}$ hardness range is 186–230.

The name is for the discovery site. A type specimen is deposited in the British Museum (Natural History). **C.A.F.**

## Iron barringerite (= barringerite)

Kegiao, C., Zaimiao, J., and Zhizhong, P. (1983) The discovery of iron barringerite, $(Fe_2P)$ in China. Scientia Geol. Sinica, 199–202. (in Chinese).

Analysis of a sample from the oxidation zone of "a certain platinum bearing, copper-nickel sulfide deposite in China" gave Fe 76.22, Ni 2.85, Cr 0.73, P 20.21, sum = 100.01%, corresponding to $(Fe_{2.094}Ni_{0.07}Cr_{0.02})P_{1.00}$. It is hexagonal, $P\bar{6}2m$, with $a$ = 5.857, and $c$ = 3.452Å.

### *Discussion*

The original barringerite from a meteorite was $(Fe_{1.16}Ni_{0.84}Co_{0.01})P$; this is simply end-member barringerite. **M.F.**

## Lannonite*

S. A. Williams and F. P. Cesbron (1983) Wilcoxite and lannonite, two new fluosulphates from Catron County, New Mexico. Min. Mag., 47, 37–40.

Microchemical tests and DC arc spectroscopy gave CaO 12.06, MgO 4.46, $Al_2O_3$ 11.06, $SO_3$ 34.40, $H_2O$ 32.00, F 9.44, corrected total 99.45%, leading to the formula $HCa_4Mg_2Al_4(SO_4)_8F_9 \cdot 32H_2O$. Lannonite is insoluble in water but dissolves readily in cold dilute acids.

The X-ray powder data are indexed using a tetragonal unit cell: $a$ = 6.84, $c$ = 28.01Å. The strongest lines (26 reported) are 13.98(100)(002), 4.840(70)(110), 3.456(70)(017), 3.980(50)(114), and 3.325(50)(022). D calc. 2.32, meas. 2.22. Z = 1.

Lannonite is chalky white, occuring as nodules composed of 10–20 μm square plates. It is a post-mine product associated with gypsum, khademite, and wilcoxite at the Lone Pine mine, Catron County, New Mexico. H = 2. Uniaxial positive, $\omega$ = 1.460, $\epsilon$ = 1.478.

Lannonite was named for Dan Lannon, who staked important claims in this district in 1893. Type material is to be deposited in the collections of the University of Arizona (Tucson) and the British Museum (Natural History). **C.A.F.**

## Mundrabillaite*

P. J. Bridge and R. M. Clarke (1983). Mundrabillaite—a new cave mineral from Western Australia. Min. Mag. 47, 80–81.

Electron microprobe analyses averaged CaO 20.4, $P_2O_5$ 48.6, $K_2O$ 1.09–0.60, $Fe_2O_3$ 0.08–0.02, $SO_3$ and MgO both 0.04%. Qualitative tests for $NH_3$ and $H_2O$ were positive. It is soluble in water. X-ray powder diffraction study shows this mineral to be a potassian variety of $(NH_4)_2 Ca (HPO_4)_2 \cdot H_2O$ (form A).

The X-ray data were indexed using a monoclinic cell with possible space groups $Pm$, $P2$, or $P2/m$ and unit cell parameters $a$ = 8.643, $b$ = 8.184, $c$ = 6.411Å, $\beta$ = 98.0°. The lines are 8.60(30)(100), 4.279(100)(200), 3.687(40)(120), 3.106(60)(102, 211,121), 2.873(30)(112,300,102), 2.728(20)(030), 2.116(15)(003). D calc. 2.09, meas. 2.05 (synthetic material). Z = 2.

The mineral occurs as colorless, tiny crystals with an earthy luster in association with numerous other salts in the Petrogale Cave (31°54′S, 127°00′E) near Mundrabilla Station, Western Australia. H is very low. Optically, biaxial negative; $\alpha$ = 1.522(2), $\beta$ = 1.544(2), $\gamma$ = 1.552(2) with extinction inclined at +26(1)°. Synthetic material is biaxial negative; $\alpha$ = 1.521, $\beta$ = 1.542, $\gamma$ = 1.551, 2$V$ 65° (obs) 66° (calc); $b = X$, $c \wedge Y = +25°$.

The name is for the locality. Type specimens are preserved in the West Australian Government Chemical Laboratories (Perth). **C.A.F.**

## Natrobistantite*

A. V. Voloshin, Ya. A. Pakhomovskii, V. I. Stepanov, and F. N. Tyusheva (1983) Natrobistantite, $(Na,Cs)Bi(Ta,Nb,Sb)_4O_{12}$, a new mineral from granitic pegmatite. Mineralog. Zhurnal, 5, 82–86 (in Russian).

Microprobe analyses of 3 samples (blue-green crystals, fine-grained colorless aggregates, and yellow-green grains) gave $Na_2O$ 1.98, 2.05, 2.04; $Cs_2O$ 3.90, 3.99, 4.10; CaO 0.65, 0.10, 0.10; $Bi_2O_3$ 22.97, 23.02, 23.16; $Ta_2O_5$ 56.38, 56.46, 56.46; $Nb_2O_5$ 11.00, 11.21, 11.21; $Sb_2O_5$ 2.13, 2.07, 2.24; $TiO_2$ 0.09, 0.10, 0.09, sum 99.10, 99.00, 99.40%. A small amount of hydroxyl may be present. The third analysis gives the formula $(Na_{0.73}Cs_{0.32}Ca_{0.02})_{1.07}Bi_{1.09}(Ta_{2.83}Nb_{0.93}Sb_{0.15}Ti_{0.02})_{3.93}O_{12}$ or $(Na,Cs)Bi(Ta,Nb,Sb)_4O_{12}$, Na > Cs, Ta > Nb. It is the analogue of cesstibtantite (67, 413–414 (1982)) and belongs to the Pyrochlore group.

Cubic, *Fd3m*, $a = 19.502$Å, Z = 4, G meas. 6.1–6.2, calc. 6.32. The strongest X-ray lines (43 given) are 6.07(6)(111), 3.17(5)(113), 3.03(10)(222), 2.628(8)(400), 1.858(9)(404). Isotropic, reflectances 486 nm., 16.7%, 589 nm. 17.0%, 656 nm, 15.7%. Colorless grains luminesce red-orange in UV light, colored varieties do not luminesce.

The mineral occurs in museum samples from granite pegmatite Kyokbogor, China, formed by replacement of bismutotantalite and replaced in turn by microlite. Associated minerals include Bi oxides, the bismuth vanadates pucherite and clinobisvanite and an unnamed vanadate of composition $Bi_5V_2^{+5}O_{11}(OH)_3$.

The name is for the composition. Type material is at the Fersman Museum, Moscow. **M.F.**

### Niahite*

P. J. Bridge and B. W. Robinson (1983) Niahite—a new mineral from Malaysia. Min. Mag., 47, 79–80.

Electron microprobe analyses and microchemical tests gave $(NH_4)_2O$ 12.9, MnO 27.21, MgO 4.19, CaO 1.99, $P_2O_5$ 37.83, $H_2O$ 11.88, sum 96.00%, which yielded the empirical formula

$$(NH_4)^{2+}_{0.93}(Mn_{0.72}Mg_{0.20}Ca_{0.06})_{\Sigma 0.98}P_{1.00}O_{3.95} \cdot 1.23\ H_2O.$$

X-ray powder data are similar to those for the synthetic compounds $(NH_4)MnPO_4 \cdot H_2O$ and $(NH_4)MgPO_4 \cdot H_2O$. Niahite is indexed on an orthorhombic cell with $a = 5.68$, $b = 8.78$, $c = 4.88$Å. The strongest lines (11 reported) are 8.82(100)(010), 4.79(50)(110), 4.267(60)(011), 2.845(80)(200), 2.832(90)(121). Indices satisfy the extinction criteria for space group $Pmn2_1$. D calc. 2.437, meas. 2.39. Z = 2.

Niahite occurs as pale orange radiating and subparallel clusters of crystals up to 0.5 mm in size in fine-grained newberyite in the Niah Great Cave, Sarawak, Malaysia. Optically, biaxial negative, $2V$ 54° (obs.), 50° (calc.); $\alpha = 1.582(2)$, $\beta = 1.604(2)$, $\gamma = 1.609(2)$.

The name is for the locality. Type specimens are preserved at the West Australian Government Chemical Laboratories (Perth), Malaysian Geological Survey (Kuching) and the Bureau of Mineral Resources (Canberra). **C.A.F.**

### Tolbachite*

L. P. Bergasova and S. K. Filatov (1983) The new mineral tolbachite. Doklady Akad. Nauk SSSR, 270, 415–417 (in Russian).

Material collected from incrustations of fumaroles of basaltic lava flows of the Tolbachin eruption of 1975–1976 contained fibrous, moss-like brown to gold-brown growths associated with melanothallite, dolerophanite, tenorite, euchlorine, and a K–Cu-basic sulfate chloride. Analysis of a water extract gave $Na_2O$ 0.74, $K_2O$ 1.50, CuO 51.99, PbO 0.11, ZnO 0.30, $SO_4$ 4.24, Cl 42.59, $H_2O^-$ 4.45, $H_2O^+$ 1.05, insol. 2.68, total 109.65 − (0 = $Cl_2$) 100.04%. After deducting impurities, this is close to $CuCl_2$. The mineral is readily soluble in cold water; in air is quickly transformed to eriochalcite, $CuCl_2 \cdot H_2O$.

X-ray study showed lines corresponding to those of eriochalcite and to those of synthetic $CuCl_2$. The strongest lines (5 given) are 5.76(100)(001), 3.445(25)(20$\bar{1}$), 2.915(35)(200). The data are indexed on a monoclinic cell, space group *C2/m*, $a = 6.89$, $b = 3.31$, $c = 6.82$Å, $\beta = 122.3°$, Z = 2, G calc. 3.42.

The mineral is pleochroic from pale greenish perpendicular to the elongation to dark brown parallel to the elongation. Birefringence high, elongation positive, *ns* could not be measured because the mineral reacts with immersion media. Synthetic $CuCl_2$ has cleavage perfect (001).

The name is for the locality. Type material is at the Leningrad Mining Institute.

*Discussion*

The occurrence was foreshadowed by K. J. Murata (Am. J. Sci., 258, 769–772 (1960)) by spectroscopic observation of the band of CuCl in emissions from flows at Kilauea, and by Delsemme, Acad. Roy. Sci. Outre-Mer, 6, 507–519 (1960), who made a similar observation on flames from Nyiragongo Volcano. **M.F.**

### Wilcoxite*

S. A. Williams and F. P. Cesbron (1983) Wilcoxite and lannonite, two new fluosulphates from Catron County, New Mexico. Min. Mag., 47, 37–40.

Microchemical tests and DC arc spectroscopy gave MgO 6.61, $Al_2O_3$ 8.13, $Fe_2O_3$ 0.46, MnO 0.13, $SO_3$ 27.50, $H_2O$ (Penfield) 56.40, F 3.48, corrected total 101.24%. DTA shows two endothermic peaks, one simple at about 55°C and one complex at 110–140°C, both representing water loss. The formula derived is $MgAl(SO_4)_2F \cdot 18H_2O$.

Precession study showed wilcoxite to be triclinic, $P\bar{1}$ or $P1$, with refined unit cell parameters of $a = 14.90$, $b = 6.65$, $c = 6.77$, $\alpha = 117°26'$, $\beta = 100°35'$, $\gamma = 89°10'$. The strongest lines (15 reported) are 4.908(100)(1$\bar{1}$1), 5.654(90)(11$\bar{1}$,110), 4.371(60)(201, 2$\bar{1}$0), 3.384(50)(11$\bar{2}$,41$\bar{1}$,111), 5.877(40)(010), 4.117(40)(31$\bar{1}$). D calc. 1.67, meas. 1.58±0.01. Z = 1.

Wilcoxite occurs as limpid prisms bounded by the forms {010}, {110}, {100}, {$\bar{1}$10}, and {0$\bar{1}$1}, forming crusts in a breccia zone, in pools in the adit and effluorescences on the walls of the Lone Pine mine, Catron County, New Mexico. It is a post mine product associated with gypsum, khademite, and lannonite. H = 2. Optically, biaxial negative; $\alpha = 1.424$, $\beta = 1.436$, $\gamma = 1.438$, and $2V_\alpha = 48°$. Dispersion unnoticeable.

The name honors William Wilcox who discovered this mining district in 1879. Type material is to be preserved in the collections of the University of Arizona (Tucson) and the British Museum (Natural History). **C.A.F.**

### Uranosilite*

K. Walenta (1983) Uranosilite, a new mineral from the uranium deposit at Menzenschwand (southern Black Forest). Neues Jahrb. Mineral, Monat., 259–269 (in German).

Uranosilite, previously referred to as an "unknown siliciferous mineral" (Walenta, Am. Min., 59, 170–171, 1974), occurs in intimate intergrowth with studtite and uranophane on quartz and hematite. Needle-like orthorhombic crystals are discernible only by SEM at high magnification. Microprobe analysis supplemented by direct determination of oxygen (method not reported) yielded: U 31.0, Si 28.5, K 1.2, Pb 1.5, O 38.0, sum 100.3%, corresponding closely to $UO_3 \cdot 7SiO_2$ with minor substitution of

K and Pb for U. The powder X-ray diffraction pattern was indexed on an orthorhombic cell with $a = 11.60$, $b = 14.68$, and $c = 12.83$Å; possible space groups are given as $P22_12_1$, *Pmmb*, and *Pmcb*, Z = 4, D (calc.) = 3.25. The strongest lines in the powder pattern are: 11.58(9)(100), 7.30(10)(020), 6.19(9)(120), 3.50(8)(123,140), and 2.77(7)(242,043,151,411,214). Uranosilite is yellowish white with vitreous luster. There is no discernible cleavage and hardness is not determinable. The mineral is biaxial negative with $\alpha = 1.570(2)$, $\gamma = 1.584(2)$; the needles show positive elongation and slightly anomalous interference colors. Heating to 900°C causes no change in the powder diffraction pattern, but reduces the refractive indices to the range 1.54–1.55. This change is attributed to the loss of "zeolitic water". **A.P.**

### Xilingolite*

Hong Huidi, Wang Xiangwen, Shi Nicheng and Peng Zhizhong (1982) Xilingolite, a new sulfide of lead and bismuth, $Pb_{3+x}Bi_{2-2/3x}S_6$. Acta Petrologica Mineralogica et Analytica, 1, 14–18 (in Chinese with English abstract).

Wet chemical and electron microprobe analyses gave Pb 52.074, 52.06; Zn 0.653, --; Cu 0.16, --; Ag 0.75, 0.50; Bi 29.72, 29.81; Sb 0.09, --; S 15.09, 15.25; $SiO_2$ 0.65, 0.43; $TiO_2$ --, 0.02; $Al_2O_3$ 0.10, 0.62; $Fe_2O_3$ 0.493, 0.52; MgO 0.07, --; CaO 0.02, 0.01; $SnO_2$ --, 0.01; $Cr_2O_3$ --, 0.01; sums 99.87, 99.24. The chemical analyses, ignoring oxides, correspond to $Pb_{3.18}Zn_{0.13}Cu_{0.03}Ag_{0.09}Bi_{1.81}Sb_{0.01}S_6$, or simply $Pb_{3.18}Bi_{1.81}S_6$, or ideally $Pb_{3+x}Bi_{2-2/3x}S_6$ where x = 0.3, Z = 4.

Weissenberg photographs showed the mineral to be monoclinic, *C2/m*, *C2* or *Cm*, $a = 13.65$, $b = 4.078$, $c = 20.68$Å, $\beta = 93.0°$. The strongest lines of the X-ray powder pattern are: 3.386(100)(113), 2.177(90)(407), 2.073(80)(317), 2.051(70)(514), 1.955(70)(023), 1.788(6)(2.0.11), 1.396(5)(808). The mineral is not a dimorph of lillianite despite similarities in composition and cell parameters.

The mineral is lead gray with gray streak and metallic luster. Crystals (0.09–8.32 mm) are prismatic, elongate along *b* with longitudinal striations. Twinning (001) was present. Density obs. 7.08, calc. 7.07, VHN (5–200 g) 101.4–104.9 kg/mm$^2$. The reflection color is white with a faint blue tint. The reflection pleochroism is distinct both in air and in oil, white ($\parallel b$) and white with blue tint ($\perp b$). The mineral is distinctly anisotropic, dark gray to gray. Dispersion DRr $v>r$, DAr $v<r$ (weak). Reflectances are (λnm, $R_{\gamma'}$%, $R_{\alpha'}$%): 405, 46.6, 43.2; 436, 46.8, 44.5; 480, 46.8, 44.3; 526, 44.9, 44.2; 546, 44.5, 41.8; 578, 44.1, 41.4; 589, 43.8, 40.9; 622, 43.3, 40.5; 644, 43.0, 40.0; 656, 43.0, 39.9; 664, 43.0, 39.8; 700, 41.2, 37.5. Color values are ($R_{\gamma'}$, $R_{\alpha'}$): $R_{vis}$ 44.4, 41.1; x 0.3193, 0.3261; y 0.3321, 0.3298; $\lambda_d$ 499 nm, 485 nm; $P_e$ 0.0483, 0.0271.

The mineral occurs in a skarn type iron deposit in the Chaobuleng district, Xilingola League, Inner Mongolia Autonomous Region, China. The associated minerals are magnetite, sphalerite, pyrrhotite, pyrite, arsenopyrite, chalcopyrite, digenite, bornite, molybdenite, galena, bismuth, and bismuthinite. The name is for the locality. **G.Y.C.**

### Unnamed BaCaMnFeTi silicate

R. L. Mauger (1983) Bafertisite and an unidentified BaCaMnFeTi silicate from Fountain Quarry, Pitt County, North Carolina, Southeastern Geology, 24, 13–20.

Microprobe analysis yielded $SiO_2$ 35.00, $TiO_2$ 9.55, $Al_2O_3$ 1.57, FeO 30.48, MnO 6.99, MgO 0.51, CaO 2.91, $Na_2O$ 1.02, $K_2O$ 0.96, F 0.94, BaO 4.31, loss on ignition 4.67 {less 0.40 O = F, (P.J.D.)}, sum = 98.51%. The strongest lines in the X-ray powder diffraction pattern are 17.1 (s), 11.4 (vs), 8.31 (m), 3.33 (m), 3.27 (m), 2.87 (m).

This unknown mineral occurs as brownish-gray fibrous material with a silvery-pink hue. The color darkens with time to dark brown. Optically, it is biaxial, negative, $2V \sim 70°$ with indices of refraction $\beta = 1.72–1.73$, $\gamma = 1.75–1.76$; pleochroism is Z = dark yellow brown, Y = light yellow brown; extinction is parallel. This phase occurs associated with bafertisite and acmite at the Fountain Quarry, Pitt Co., North Carolina. **P.J.D.**

### Unnamed cuprian palladium arsenide

Y. Vuorelainen, T. A. Häkli, E. Hänninen, H. Papunen, J. Reino and R. Törnroos (1982) Isomertieite and other platinum-group minerals from the Konttijärvi layered mafic intrusion, northern Finland. Econ. Geol., 77, 1511–1518.

Analysis by electron probe gave Pd 71.80, Cu 6.36, Ni 0.25, Fe 0.24, Au 0.22, Ag 0.17, As 14.77, Sb 2.72, Te 0.50, sum 97.03. A general formula of $(Pd,Cu)_7As_2$ has been proposed. The mineral, found in heavy mineral concentrates from the Konttijärvi layered mafic intrusion, Finland, is an alteration product of unnamed $Pd_5As_2$. It is grayish and strongly anisotropic.

*Discussion*

This may be related to the unidentified Pd–Cu–As alteration product associated with unnamed $Pd_5As_2$ (Am. Min., 62, 1057–1061) from the Stillwater Complex, however the present authors do not mention whether the mineral tarnishes. **L.J.C.**

### Unnamed palladium arsenate

Y. Vuorelainen, T. A. Häkli, E. Hänninen, H. Papunen, J. Reino and R. Törnroos (1982) Isomertieite and other platinum-group minerals from the Konttijärvi layered mafic intrusion, northern, Finland. Econ. Geol., 77, 1511–1518.

Analyses by electron probe gave Pd 84.85, Cu 3.52, Ni 2.37, Fe 0.03, O 6.34, As 3.71, Sb 0.09, sum 100.98. The mineral was found in heavy mineral concentrates from the Konttijärvi layered mafic intrusion, Finland, as an alteration product of unnamed $(Pd,Cu)_7(As,Sb)_2$. It is dark grayish in color and has distinct anisotropism. The mineral is said to be oxygen-bearing and, if interpreted as a hydrated arsenate, has the formula $(Pd,Cu,Ni)_{18}AsO_4 \cdot 4H_2O$.

*Discussion*

No information is provided on the oxygen analysis: it is listed as though oxygen was determined by electron probe and not by difference. **L.J.C.**

### Unnamed palladium arseno-bismuthide

L. J. Cabri (1981) Unnamed platinum-group minerals. *In* Platinum-Group Elements: Mineralogy, Geology, Recovery (L. J. Cabri, ed.), CIM Spec. Vol. 23, 175–195.

Analysis by electron probe gave Pd 61.5, Pt 0.89, Bi 25.2, Pb 6.3, As 5.4, Te 1.1, Sb 0.03, sum 100.42 which may be calculated, based on 4 atoms, as $(Pd_{2.84}Pt_{0.02})(Bi_{0.59}As_{0.35}Pb_{0.15}Te_{0.04}Sb_{<0.01})$. A single grain (40 × 90 μm) was found attached to palladobismutharsenide with sperrylite, siderite(?) and gangue in a heavy mineral concentrate from the Stillwater Complex, Montana. In polished section the mineral off-white with a yellow tinge, paler than palladobismutharsenide. Bireflection not observed in air and oil, weakly anisotropic from extinction to dark grayish-brown (air) and grayish tones (oil). Polishing hardness less than palladobismutharsenide. **L.J.C.**

### Unnamed palladium telluride ($Pd_8Te_3$)

L. J. Cabri (1981) Unnamed platinum-group minerals. *In* Platinum-Group Elements: Mineralogy, Geology, Recovery (L. J. Cabri, ed.), CIM Spec. Vol. 23, 175–195.

Analyses by electron probe gave Pd 68.2, 68.2; Pt 0.98, 0.61; Te 30.4, 30.6; Hg, Sb not detected; sums 99.58, 99.41. The analyses may be calculated on 11 atoms to give $(Pd_{7.98}Pt_{0.06})Te_{2.96}$ and $(Pd_{7.97}Pt_{0.04})Te_{2.99}$ or more simply $Pd_8Te_3$. An X-ray powder pattern (Gandolfi, Cu/Ni) gave 3.01(<1), 2.919(7), 2.724(3), 2.427(4), 2.215(10), 1.927(8), 1.829(1), 1.720(1), 1.632(9), 1.552(1), 1.482(1), 1.433(1), 1.392(1), 1.343(1), 1.329(1), but the pattern could not be indexed.

The mineral was found in heavy mineral concentrate from diamond drill core, Stillwater Complex, Montana, as complex polycrystalline grains varying from 40 × 50 to 60 × 100 μm in size. Associated inclusions were Pt–Cu alloy, keithconnite, laurite, moncheite, hollingworthite, and altered braggite.

In polished section the mineral is cream with strong bireflection in air from cream to bluish-gray. The anisotropy is also strong in air, from extinction to pale yellowish-gray. 5° off extinction the colors are deep blue to yellow or bluish-brown to grayish-yellow.

The $Pd_8Te_3$ phase was synthesized, although not reported in the literature, and has the same distinctive polycrystalline appearance and optical properties as the mineral in polished section.

*Discussion*

This appears to be a new mineral species requiring more complete X-ray data for characterization. **L.J.C.**

### Unnamed $PbCuBi_7S_{12}$

Liang Guixiang, Guan Yaxian, Liu Wan and Bian Tonglin (1981) A new subspecies of bismuthal sulfosalt minerals: $PbCuBi_7S_{12}$. Changchun Dizhi Xueyuan Xuebao, No. 4, 20–22, (in Chinese).

Average electron microprobe analyses of four grains gave Pb 10, Cu 3.4, Bi 68.5, S 18, sum 99.9%, corresponding to $PbCu_{1.1}Bi_{6.8}S_{11.6}$ or ideally $PbCuBi_7S_{12}$.

Laue, rotation and *hk*0 Weissenberg photographs showed the mineral to be orthorhombic, $a = 11.19$, $b = 11.49$, $c = 4.02$Å, space group to be determined. The strongest lines in the Gandolfi X-ray pattern (14 main lines given) are 3.99(3), 3.59(10), 3.55(4), 3.12(8), 2.82(6), 2.72(3), 2.53(4), 2.25(3), 1.74(3).

The mineral is lead white, and under reflected light it is white with an olive green tint. The bireflectance is not noticeable. It is distinctly anisotropic, purplish blue to yellowish green. Internal reflection is absent. Reflectances (λ, $R_{g'}$, $R_{p'}$) are: 480 nm, 44.1 40.4; 546 nm 43.9, 40.1; 589 nm, 43.8, 39.1; 656 nm, 42.9, 38.7%. VHN = 120–181 kg/mm$^2$, corresponding to 3–4 on Mohs scale. D calc. = 6.9. The mineral has one prismatic cleavage.

The mineral occurs as hemihedral and irregular grains (0.07–0.04, max, 0.4 mm) and as needle-like to prismatic individuals in a skarn deposit in a granodiorite-limestone contact zone in the Qinglongshan area, Zhelimu League, Inner Mongolia autonomous region, China. The associated minerals are chalcopyrite, sphalerite, magnetite, and minor pyrite, galena, bismuthinite and native bismuth.

*Discussion*

Despite the fact that the authors considered the mineral to be a subspecies in the aikinite-bismuthinite series the mineral deserves species rank provided more complete data are available. The powder pattern and cell parameters of $PbCuBi_7S_{12}$ compared favorably with those of the synthetic compound of the same composition (Mariolacos, 1979, N. Jb. Miner. Mh. 73–80 and Zak and Prachar, 1981, N. Jb. Miner. Mh. 495–504). The space group predicted for $PbCuBi_7S_{12}$ is $Pb2_1m$ (Synecek and Hybler, 1974, N. Jb. Miner. Mh. 541–562.). A compound similar to this one was abstracted in Am. Min., 63, 427. **G.Y.C.**

### Unnamed Pt–Pb–Cu sulfide

C. H. McLaren and J. P. R. De Villiers (1982) The platinum-group chemistry and mineralogy of the UG-2 chromitite layer of the Bushveld Complex. Econ, Geol. 77, 1348–1366.

An unidentified anisotropic Pt–Pb–Cu sulfide is reported from the UG-2 chromitite layer of the Bushveld Complex. The mineral occurs as solid idiomorphic crystals, as for the unidentified Pt–Ir–Rh–Cu sulfide, and also as skeletal or xenomorphic crystals in chromite or silicate. It is associated with base metal sulfides, galena, and cooperite.

*Discussion*

An incomplete description. **L.J.C.**

### Unnamed Pt–Rh–Ir–Cu sulfide

C. H. McLaren and J. P. R. De Villiers (1982) The platinum-group chemistry and mineralogy of the UG-2 chromitite layer of the Bushveld Complex. Econ. Geol, 77, 1348–1366.

A Pt–Ir–Rh–Cu–S mineral, also referred to as Pt–Rh–Cu–S with Pt > Rh and Cu, was found to be one of the major platinum-group minerals in the UG-2 chromitite layer of the Bushveld Complex. Also may have minor Os, Ni, Co, Mo or As. Occurs as idiomorphic crystals of prismatic habit, commonly needle-shaped, but ranges to hypidiomorphic crystals. As inclusions in silicates or chromites and associated with braggite, cooperite, pentlandite, pyrite and chalcopyrite. Reported to be similar to unnamed species described by Begizov et al. (1975).

*Discussion*

An incomplete description, even of a qualitative nature. The unnamed minerals of Begizov et al. (1975) cannot be related as those are $\sim(Rh,Ir)_2S_3$ and $\sim Ir_2S_3$. **L.J.C.**

### Unnamed rhodium antimonide (RhSb)

A. J. Aubut (1979) The Geology and Mineralogy of a Tertiary Buried Placer Deposit, Southern British Columbia. M.Sc. thesis, Univ. of Alberta.

Analysis by electron probe gave Rh 44.36, Ir 1.32, Pt 1.06, Cu 0.30, Fe 0.06, Ni 0.01, Os 0.01, Sb 51.29, S 0.02, sum 98.43. The mineral was found as rare ($<8$ μm) inclusions in a tulameenite-bearing Pt–Fe nugget from a buried placer in the Tulameen river area, British Columbia. In polished section the mineral is reported to be brownish-gray and weakly anisotropic. The polishing hardness is similar to that of tulameenite.

*Discussion*

X-ray data needed to confirm a new species and compare with synthetic RhSb which is orthorhombic (Pfisterer and Schubert, 1950, Z. Metallkunde. 41. 358–367). **L.J.C.**

## New Data

### Falkmanite, Plumosite

N. N. Mozgova, N. S. Bortnikov, A. I. Tsepin, Yu. S. Borodaev, S. V. Vrublevskaja, L. N. Vyalsov, O. V. Kuzmina and A. V. Sivtov (1983) Falkmanite, $Pb_{5.4}Sb_{3.6}S_{11}$, new data and relationship with sulphantimonites of lead (re-examination of type material from Bayerland Mine, Bavaria). Neues Jahrb. Mineral. Abh., 147, 80–98.

Falkmanite was named by Ramdohr and Ödman (Neues Jahrb. Mineral. Abh., 75, 315–340, 1940) for a mineral recognized by them to be similar to boulangerite $Pb_5Sb_4S_{11}$, but which gave compositions close to $Pb_3Sb_2S_6$. On the basis of single-crystal studies of falkmanite, including a specimen donated by Ramdohr from the Bayerland mine (Bavaria) type locality, Robinson (Am. Min., 33, 716–733; 1948) concluded that this mineral was identical to boulangerite. Also regarded as synonymous with boulangerite is plumosite, which dates to the last century and originated from mineral compositions corresponding to $Pb_2Sb_2S_5$.

Four microprobe analyses of type-locality falkmanite averaged Pb 58.86, Cu 0.08, Sb 23.36, Bi 0.28, Se 0.25, S 17.99, sum 100.82 wt.%; Cu, Bi and Se were not detected in one or more of the analyses. The average corresponds to $Pb_{3.00}Cu_{0.01}Sb_{2.02}Bi_{0.01}S_{5.92}Se_{0.03}$, ideally $Pb_3Sb_2S_6$ as compared with boulangerite $Pb_5Sb_4S_{11}$ (Pb 55.24, Sb 25.96, S 18.80 wt.%). X-ray powder patterns of falkmanite and boulangerite are almost identical, the most notable difference being the absence of weak lines at 4.20, 3.59, and 3.13Å in boulangerite. Refinement of the powder data (57.3 mm camera) gave $a = 21.63$, $b = 23.52$, $c = 8.12$Å, $\beta = 100.83°$, identical to the cell dimensions of boulangerite. Whereas boulangerite has a subcell with $c' = ½c$, falkmanite has a subcell with $a' = ½a$. Optical properties, reflectivities, and Vickers microhardness are similar for both minerals, but falkmanite is concluded to be optically positive and boulangerite to be negative. Boulangerite is known to have several mixed Pb-Sb sites in its structure and it is concluded that the mineral shows a range of solid solution principally because of variation in the proportions of Pb and Sb in the mixed sites. It is proposed that the names falkmanite and plumosite be revived and applied in a generalized boulangerite formula $Pb_{5+x}Sb_{4-x}S_{11}$ such that $x = 0.3$ to $-0.2$ for boulangerite, $x > 0.3$ for falkmanite, and $x < 0.2$ for plumosite. Because of the similarity of the X-ray diffraction data for all three, each is defined only on the basis of its chemical composition [within the boulangerite group].

*Discussion*

This paper can serve as a model example of the difficulties confronting mineralogists concerned with sulfosalt nomenclature. Previous studies have shown boulangerite to be monoclinic $a = 21.52$, $b = 23.46$, $c = 8.07$, $\beta$ 100.80°, and also orthohombic $a = 42.28$, $b = 23.46$, $c = 8.07$Å (L. G. Berry, Univ. Toronto Studies, Geol. Ser. 44, 5–19, 1940; Born and Hellner, Am. Min., 45, 1266–1271, 1960; Dornberger-Schiff and Höhne, Chem. Erde 22, 78–82. 1962). Synthetic boulangerite is orthorhombic $a = 21.4$, $b = 23.5$, $c = 4.04$Å (Sugaki et al., Yamaguchi Univ. Technol. Rept. 1, 183–194, 1973; Petrova et al., Dokl, Akad. Nauk SSSR 242, 337–340, 1978). Despite the cell and symmetry variations, all the phases have been referred to only as boulangerite. The presence of a subcell with $a' = ½a$ in falkmanite does not obscure the dimensional equivalence of the falkmanite and monoclinic boulangerite cells. No space group is given for falkmanite and the indices assigned to the powder pattern are compatible with a normal boulangerite cell rather than with a cell having $a' = ½a$.

The intent of the authors is to apply the names falkmanite and plumosite to a homologous series rather than a solid-solution series. Unfortunately, the laudable goal of simplifying the nomenclature rests on the acceptance of the authors' proposal that the falkmanite unit cell is different from that of normal boulangerite, and thus falkmanite represents a crystallographic break rather than an extension of boulangerite s.s. If one does not accept this contentious proposal, then falkmanite is a Pb-rich boulangerite. In the case of plumosite, an extension to Pb-poor compositions is indicated by microprobe analyses and boulangerite-type X-ray powder patterns, but no single-crystal data are available. Unlike falkmanite-boulangerite, the gap in compositions between plumosite and boulangerite s.s. is farily large.

This reviewer's opinion is that the proposed homologous series probably exists, but that its existence has not yet been proved. A ruling by the Commission on New Minerals and Mineral Names, I.M.A., prior to re-introduction of the names falkmanite and plumosite would have been highly desirable. **J.L.J.**

### Hongshiite

Yu Zuxiang (1982) New data for Hongshiite. Bull. Institute of Geology, Chinese Academy of Geological Sciences, 4, 78–81 (in Chinese with English abstract).

Electron microprobe analyses on four grains, using PtCu alloy, Cu and Pt metals as standards, gave Pt 76.04, 74.94, 74.97, 73.79; Cu 24.55, 24.49, 24.38, 24.65; sums 100.59, 99.44, 99.35, 98.44%, average Pt 74.93, Cu 24.52, sum 99.45, corresponding to $Pt_{0.499}Cu_{0.501}$ or ideally CuPt. The large amount of As in the preliminary report (Am. Min., 61, 185, 1976) was due to inclusions of sperrylite. The mineral is not soluble in HCl and $HNO_3$.

The powder X-ray data are indexed on a rhombohedral cell (by analogy to ordered CuPt) with $a = 10.713$, $c = 13.192$Å, $a_{rh} = 7.589$Å, $\alpha = 89°47'34''$, space groups $R32$, $R3m$ or $R\bar{3}m$. The strongest X-ray lines (18 given) are 2.199(10)(222), 1.895(8)(400), 1.350(5)(440), 1.325(5)(522), 1.148(8)(622), 0.856(5)$(7\overline{25})$.

The mineral occurs as granular masses, dendritic aggregates and rarely as tarnished plates. It is lead gray with metallic luster and black streak. It is brittle somewhat malleable and ductile, non-magnetic. In reflected light the mineral is bright white with a slight brownish tint, weakly to moderately anisotropic, dull gray to dull reddish brown. Reflection pleochroism is absent both in air and oil. Bireflectance is weak in oil. Reflectances (λ, $R_e$, $R_o$) are: 480 nm 58.9, 56.7; 546 nm, 62.8, 60.5; 589 nm, 65.8, 63.8. VHN(50g) 204.3 ($\|a$), 276.8 kg/mm$^2$ ($\|c$) corresponding to 4 on Mohs scale. The mineral takes polish well.

The mineral was originally found in the Yen district, China. The name was for the locality. Analysed specimens are deposited with the Institute of Geology, Chinese Academy of Geological Sciences, Beijing, China.

### *Discussion*

The author acknowledged errors in his preliminary study of the mineral (Am. Min., 61, 185, 1976, also see Am. Min., 65, 408 and Ding, K., 1980, Scientia Geol. Sin. No. 2, 168–171), regarding the composition, crystal symmetry and cell parameters. The new data appear to be self-consistent. The locality was previously given as the Hung District. Single crystal X-ray study is desirable. **G.Y.C.**

## Ramdohrite

E. Makovicky (1983) The crystal structure of ramdohrite, $Pb_6Sb_{11}Ag_3S_{24}$, and its implications for the andorite group and zinckenite. Neues. Jahr. Mineral. Abh., 147, 58–79.

Crystal structure analysis of a ramdohrite crystal from the Chocaya Mine, Potosi Bolivia, was refined to $R = 20.2\%$. Unit cell parameters, given to have the $\beta$ angle correspond to the angle $\alpha$ in andorite, are: $a = 19.24$, $b = 13.08$, $c = 8.73$Å, $\beta = 90.28°$, space group $P2_1/n$. Microprobe analysis gave Pb 33.84, Sb 34.91, Ag 8.96, S = 2.14, sum = 98.85%, corresponding to $Pb_{6.16}Sb_{10.92}Ag_{2.92}S_{24}$ for the ≈4Å subcell, or ideally $Pb_6Sb_{11}Ag_3S_{24}$. **P.J.D.**

## Xingzhongite

Institute of Geochemistry, Chinese Academy of Science (1981) Platinum Deposits in China, Geochemistry of the platinum Group Elements, and platinum Group Minerals (in Chinese). Science Publishing Agency, Beijing, China, p. 190.

New analysis of xingzhongite gave Ir 43.49, Cu 3.81, Rh 7.19, Pt 9.67, Pb 12.80, Fe 1.58, S 21.68, sum 100.22%, corresponding to $(Cu_{0.36}Pb_{0.36}Fe_{0.18})_{\Sigma=0.90}(Ir_{1.33}Pt_{0.30}Rh_{0.41})_{\Sigma=2.04}S_4$ (compare (Ir,Cu,Rh)S, Am. Min., 61, 185, 1976; 65,408, 1980). The new X-ray powder pattern is indexed on a cubic cell, $a = 9.970$Å, space group $Fd3m$. The strongest X-ray lines are 5.80(8)(111), 3.00(8)(311), 2.88(5)(222), 2.49(6)(400), 1.765(10)(440), 1.335(4)(642), 1.208(8)(820).

### *Discussion*

On the basis of four S atoms, the analysis recalculates to $(Pb_{0.37}Cu_{0.35}Fe_{0.17})_{\Sigma=0.89}(Ir_{1.33}Rh_{0.41}Pt_{0.29})_{\Sigma=2.03}S_4$ which may be simplified to $(Pb,Cu)Ir_2S_4$. The new powder data differ significantly from those reported in earlier publications (Am. Min., 61, 185, 1976; 65, 408, 1980) in the number of lines, $d$-values, intensities and indices. The identity of the present mineral with the mineral described earlier under the same name is questionable. **G.Y.C.**

# Discredited Minerals

## Melanosiderite = siliceous Ferrihydrite

M. J. Wilson and J. D. Russell (1983). Melanosiderite is siliceous ferrihydrite. Min. Mag., 47, 85–87.

Melanosiderite was described by Cooke [Proceedings of the American Academy of Arts and Sciences 10, 451–452 (1875)] as a hydrated basic ferric silicate. Examination of a specimen from the type locality and corresponding to the original description (BM66908), by energy-dispersive microanalysis, infrared spectroscopy, and X-ray diffraction, showed that melanosiderite is a siliceous variety of ferrihydrite. **C.A.F.**