NEW MINERAL NAMES*

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Gatehouseite*

A. Pring, W.D. Birch (1993) Gatehouseite, a new manganese hydroxy phosphate from Iron Monarch, South Australia. Mineral. Mag., 57, 309–313.

Electron microprobe analysis gave MnO 64.42, FeO 0.19, CuO 0.03, ZnO 0.03, PbO 0.05, Al_2O_3 0.10, P_2O_5 22.18, V_2O_5 0.38, As_2O_5 3.58, H_2O_{calc} 6.44, sum 97.40 wt%, corresponding to $Mn_{5.09}Fe_{0.01}Al_{0.01}(P_{1.75}As_{0.17}V_{0.02})_{\Sigma1.94}O_8(OH)_{4.00}$, ideally $Mn_5(PO_4)_2(OH)_4$. Occurs as pale yellow, and yellow to pale brownish orange radiating to divergent bladed crystals up to 100 μm long; individuals are elongate [010], showing mainly {102}, {110}, and {001}. Adamantine luster, transparent, pale yellow streak, $H = 4$, splintery fracture, distinct {010} cleavage, some grains twinned on {001}, $D_{calc} = 3.74$ for the empirical formula, 3.85 g/cm³ for the ideal formula with $Z = 4$. Optically biaxial, sign uncertain, length slow, parallel extinction, refractive indices in two directions, 1.74(1) and 1.76(1), distinctly pleochroic from brown to nearly colorless. TEM patterns and analogy with synthetic $Mn_5(PO_4)_2(OH)_4$ indicate that the mineral is orthorhombic, space group $P2_12_12_1$; $a = 9.097(2)$, $b = 5.693(2)$, $c = 18.002(10)$ Å as refined from the powder pattern (100-mm Guinier-Hägg, $CrK\alpha_1$ radiation) with strongest lines of 2.900(100,115), 2.853(70,106), 2.802(50,021), 2.702(80,303), 2.022(15,322), and 1.608(15,330).

The mineral, which also occurs as overgrowths on arsenoclasite, is the P analogue of arsenoclasite. The new name is for Bryan M.K.C. Gatehouse (b. 1932), crystal chemist at Monash University, Melbourne, Australia. The mineral was found in cavities in a matrix of hematite, hausmannite, barite, and carbonates at the Iron Monarch Precambrian sedimentary iron ore deposit, northern end of the Middleback Ranges, South Australia. Type material is in the South Australian Museum at Adelaide and in the Museum of Victoria, Melbourne. **J.L.J.**

Jianshuiite*

Guiyan Yan, Shanghua Zhang, Mingkai Zhao, Jianping Ding, Deyu Li (1992) Jianshuiite: A new magnesium mineral of the chalcophanite group. Acta Mineral. Sinica, 12(1), 69–77 (in Chinese, English abs.).

Wet-chemical analyses gave MgO 5.29, 8.52, MnO 8.02, 0.92, MnO_2 67.65, 68.49, CaO 1.97, 2.03, SiO_2 1.20, 3.94, Al_2O_3 0.78, 0.91, P_2O_5 0.59, 1.63, Fe_2O_3 0.52, 1.41, H_2O^+ 13.37, 12.60, sum 99.39, 100.45 wt%, corresponding to $(Mg_{0.51}Mn_{0.44}Ca_{0.08})_{\Sigma1.03}Mn^{4+}_{3.03}O_{7.10}\cdot2.90H_2O$ and $(Mg_{0.85}Mn_{0.05})_{\Sigma0.90}Mn^{4+}_{3.15}O_{7.20}\cdot2.80H_2O$, ideally $(Mg,Mn)Mn^{4+}_3O_7\cdot3H_2O$. Occurs as soft, porous aggregates and massive ore in which individual grains are up to 1 × 5 μm. Color brown to brownish black, opaque, $D_{meas} = 3.60(1)$ g/cm³, $D_{calc} = 3.598$ g/cm³ for $Z = 2$. Grayish white in reflected light, distinct anisotropism, brown internal reflection. Reflectances were measured on a compressed pellet; mean values in air (SiC standard) are 23.0 (470 nm), 19.9 (546 nm), 19.1 (589 nm), and 18.6 (650 nm). The DTA pattern has strong endothermic reactions at 230 and 635 °C, the former corresponding to H_2O loss, and the latter to Mn oxidation and change of structure. The X-ray powder pattern is like that of chalcophanite, which by analogy and Rietveld refinement gave triclinic symmetry, space group $P\bar{1}$, $a = 7.534(4)$, $b = 7.525(6)$, $c = 8.204(8)$ Å, $\alpha = 89.753(8)$, $\beta = 117.375(6)$, $\gamma = 120.000(6)°$. Strongest lines of the powder pattern are 6.965(100,001), 5.539(8,100,1$\bar{1}\bar{1}$), 4.086(8,011,10$\bar{2}$,1$\bar{1}$1), 3.483(11,002), 2.449(7,3$\bar{1}\bar{2}$,12$\bar{1}$,2$\bar{3}$0), and 2.230(23,120,3$\bar{1}\bar{3}$,2$\bar{3}$1). The infrared spectrum is similar to that of chalcophanite.

The new mineral is a hypogene phase associated with various hydrated manganese oxide samples in manganese ore near Lu village, Jianshui County, Yunnan Province, China. The name is derived from the locality. Type material is in the Museum of Geology, Beijing, and in the Geology Exhibit Museum, Yunnan. **J.L.J.**

Manganosegelerite*

A.V. Voloshin, Ya.A. Pakhomovskiy, F.N. Tyusheva (1992) Manganosegelerite $(Mn,Ca)(Mn,Fe,Mg)Fe^{3+}(PO_4)_2(OH)\cdot4H_2O$: A new phosphate of the overite group from granitic pegmatites of the Kola Peninsula. Zapiski Vses. Mineral. Obshch., 121(2), 95–103 (in Russian).

Electron microprobe analyses of three grains gave MnO 16.20, 15.36, 16.37, CaO 5.33, 5.04, 5.14, MgO 2.60, 2.93, 2.83, Fe as Fe_2O_3 24.04, 18.31, 22.61, Al_2O_3 0, 6.34, 1.48, P_2O_5, 33.04, 35.03, 33.21, H_2O (by difference) 18.79, 16.99, 18.36, sum 100 wt%. The third analysis, after normalization to 2P and 1 (Fe^{3+} + Al) and adjustment of the Fe^{2+}/Fe^{3+} ratio to fit the stoichiometry, corresponds

to $(Mn_{0.61}Ca_{0.39})_{\Sigma1.00}(Mn_{0.38}Fe^{2+}_{0.33}Mg_{0.30})_{\Sigma1.01}(Fe^{3+}_{0.88}Al_{0.12})$-$_{\Sigma1.00}(PO_4)_2(OH)\cdot4.04H_2O$, ideally $(Mn,Ca)(Mn,Fe^{2+}$, $Mg)Fe^{3+}(PO_4)_2(OH)\cdot4H_2O$. The infrared spectrum is characterized by features characteristic of both OH and H_2O; the strongest absorption bands (15 reported) are at 3440, 1660, 1150, 1100, 1050, 600, and 475 cm^{-1}. Occurs as fine-grained aggregates (to 2 mm across) of poorly developed prismatic individuals up to 0.05 mm across. Yellow or yellow-green color, yellow streak, vitreous luster, $H = 3$–4, transparent in thin grains, imperfect {001} cleavage. $D_{meas} = 2.76(3)$ by heavy liquids, $D_{calc} = 2.74$ g/cm^3 for $Z = 8$. Optically biaxial positive, $\alpha = 1.657(1)$, $\beta = 1.668(1)$, $\gamma = 1.691(2)$, $2V_{meas} = 75(5)$, $2V_{calc} = 70°$; marked dispersion, $r < v$; orientation $\gamma = Y$, $\beta = X$, $\alpha = Z$, pleochroism $\alpha =$ yellow, $\gamma =$ light yellow. Single-crystal studies were not possible. By analogy with the isostructural minerals oliverite and segelerite, the symmetery is inferred to be orthorhombic, space group $Pbca$, $a = 14.89(1)$, $b = 18.79(1)$, $c = 7.408(5)$ Å from powder data (114-mm camera, Fe radiation). Strongest lines in the pattern (37 given) are 9.39(100,020), 4.70(50,040), 2.97(40,302), 2.86(90,142), 2.60(40,412,152), 2.019-(40,622), 1.966(50,182), and 1.880(50,661,0.10.0).

Occurs on accumulations of mitridatite in late fractures in granitic pegmatites of the Kola Peninsula, Russia; also locally developed from lunjokite, replacing it in pseudomorphs. Other associated minerals are eosphorite, kingsmountite, and manganoan gordonite. The new name is for the Mn analogue of segelerite. Samples have been deposited in the Fersman Mineralogical Museum, Moscow. **E.S.G.**

Potassium-fluor-richterite*

G. Della Ventura, G.C. Parodi, A. Maras (1992) Potassium-fluor-richterite, a new amphibole from San Vito, Monte Somma, Compania, Italy. Rendiconti Lincei, Sci. Fis. Nat., Ser. 9, 3(3), 239–245.

R. Oberti, L. Ungaretti, E. Cannillo, F.C. Hawthorne (1992) The behaviour of Ti in amphiboles. I. Four- and six-coordinate Ti in richterite. Eur. Jour. Mineral., 4, 425–439.

Electron microprobe analysis gave K_2O 3.75, Na_2O 4.63, CaO 7.34, MgO 24.02, FeO 0.15, MnO 0.02, SiO_2 57.13, Al_2O_3 0.24, TiO_2 0.07, F 2.86, O ≡ F 1.20, sum 99.01 wt%, corresponding to $(K_{0.67}Na_{0.34})(Ca_{1.09}Na_{0.91})$ $(Mg_{4.976}Fe_{0.017}Mn_{0.002})(Si_{7.94}Al_{0.04}Ti_{0.007})O_{22}(F_{1.35}OH_{0.65})$. The infrared spectrum has a strong absorption band at 3710 cm^{-1} attributable to OH. Occurs as light gray, euhedral, prismatic crystals up to 0.5 cm long, and as thin veinlets. Vitreous luster, transparent, white streak, $H = 5.5$, perfect {110} cleavage, nonfluorescent, $D_{meas} = 3.06(2)$, $D_{calc} = 3.03$ g/cm^3. Optically biaxial negative, $\alpha = 1.613(4)$, $\beta = 1.623(4)$, $\gamma = 1.630(4)$, $2V_{calc} = 79.4°$, nonpleochroic. Single-crystal X-ray structure study ($R = 0.019$: Oberti et al., 1992) indicated monoclinic symmetry, space group $C2/m$, $a = 9.978(1)$, $b = 17.991(2)$, $c = 5.269(1)$ Å, $\beta =$

104.90(2)°. Strongest lines of the powder pattern [reported fully only in Della Ventura et al., Periodico Mineral. (52, 617–630)] are 8.49(95,110), 3.288(80,240), 3.166(100,310), 2.831(60,330), 1.918(20,510), and 1.633(15,$\overline{6}$21).

The new mineral is associated with calcite and diopside in a skarn ejectum occurring in pyroclasts near San Vito, Monte Somma, Naples, Italy. Known also as a synthetic phase. Type material is in the Museo di Mineralogia, University of Rome, Rome, Italy. **J.L.J.**

Stibiocolusite*

E.M. Spiridonov, A.S. Badalov, V.V. Kovachev (1992) Stibiocolusite $Cu_{26}V_2(Sb,Sn,As)_6S_{32}$: A new mineral. Doklady Akad. Nauk, 324(2), 411–414 (in Russian).

Four electron microprobe analyses of specimens from Kayragach (first three values) and Chelopech gave Cu 48.53, 49.32, 49.05, 46.74, Fe 0.90, 0.92, 0.87, 1.68, Mn 0.04, 0.02, 0.06, 0.10, Co 0.01, 0.01, 0, 0, Ag 0.01, 0, 0.01, 0.03, V 3.18, 3.24, 2.96, 3.02, Sb 8.27, 7.83, 7.91, 9.87, As 3.87, 3.69, 3.83, 3.35, Sn 6.80, 5.47, 6.68, 5.23, Ge 0.14, 0.15, 0.08, 0.37, Mo 0.53, 0.52, 0.51, trace, S 29.73, 29.65, 29.20, 30.06, sum 102.01, 100.82, 101.16, 100.45 wt%. The Kayragach analyses correspond to $Cu_{26}V_2(Sb_{2.31}Sn_{1.94}As_{1.75})_{\Sigma6}S_{32}$, and both fit $Cu_{26}V_2$-$(Sb,Sn,As)_6S_{32}$. Reflectance values (Si standard, air) are given in 20-nm intervals from 400 to 700 nm; representative values are 400 22.5, 440 23.8, 480 25.5, 520 27.1, 580 29.5, 600 30.1, 640 31.0, 700 31.1. The mineral forms oval segregations 5–15 (rarely 80) μm across in tetrahedrite (Kayragach) and rounded grains up to 40 μm across in enargite and luzonite. Dark gray color, gray streak, metallic luster, $VHN_{50} = 273$ (range 260–285), no cleavage, conchoidal fracture, $D_{calc} = 4.66$ g/cm^3 for $Z = 1$ (Kayragach). In reflected light, light gray with light brown or rose-brown tint. No internal reflections, bireflectance, anisotropy, or pleochroism. Single-crystal studies were not done. The powder X-ray data (Fe$K\alpha$, 114-mm camera), indexed by analogy with colusite, correspond to isometric symmetry, space group $P\overline{4}3m$, $a = 10.705(4)$ Å, with strongest lines (35 given) of 3.10(100,222), 1.892(90,-440), 1.614(70,622), 1.226(40,662), 1.094(60,844), and 1.030(40,666,10.2.2).

The mineral, which is found in Au shoots within quartz-sulfide veins in the volcanogenic Kayragach deposit, eastern Uzbekistan, occurs in tellurian tetrahedrite ore consisting of sulfides of Sn and Bi, plus S-Te-Se compounds of Bi. The stibiocolusite aggregates are Sn-enriched toward the margins, grading into Sb-rich nekrasovite, and are surrounded by a selvage of Sb-bearing mawsonite. Stibiocolusite also occurs with luzonite, enargite, bornite, nekrasovite, and goldfieldite in Au-enriched zones in massive sulfide in the volcanogenic Chelopech deposit, Bulgaria. The new name is for a colusite with Sb > Sn,As. The type specimen is in the Fersman Mineralogical Museum, Moscow.

Discussion. The space group for stibiocolusite is probably $P\bar{4}3n$, not $P\bar{4}3m$ as presumed by the present authors, who cited Dangel and Wuensch (1970, *Amer. Mineral.*, 55, 1787–1791). Orlandi et al. (1981, *Can. Mineral.*, 19, 423–427) determined that the space group of colusite is $P\bar{4}3n$ and that the report of $P\bar{4}3m$ is in error. The hhl ($l = 2n + 1$) reflections (e.g., 333), which are needed to distinguish $P\bar{4}3m$, were not reported by the present authors. **E.S.G.**

Tounkite*

V.G. Ivanov, A.N. Sapozhnikov, L.F. Piskunova, A.A. Kashayev (1992) Tounkite $(Na,Ca,K)_8 (Al_6Si_6O_{24})$-$(SO_4)_2Cl \cdot H_2O$: A new cancrinite-like mineral. Zapiski Vses. Mineral. Obshch., 121(2), 92–95 (in Russian).

Electron microprobe analyses gave SiO_2 30.71, Al_2O_3 25.43, CaO 10.82, Na_2O 10.25, K_2O 6.46, SO_3 13.28, Cl 2.90, H_2O (by a microcoulometric method) 0.77, O $\equiv$ Cl 0.66, sum 99.96 wt%, which for 12(Al + Si) corresponds to $(Na_{3.93}Ca_{2.30}K_{1.64})_{\Sigma7.87}(Al_{5.93}Si_{6.07}O_{24})(SO_4)_{1.97}Cl_{0.96} \cdot$ $1.02H_2O$. The H_2O is inferred to be zeolitic from the dynamics of its release. Readily soluble in dilute HCl. Color is bottle green with a yellowish or bluish tint, the latter probably due to admixed lazurite. Vitreous luster, $H = 5–5.5$, medium $\{10\bar{1}0\}$ cleavage, $D_{meas} = 2.557(4)$ in thermogradient tube, $D_{calc} = 2.60$ g/cm³ for $Z = 6$. Optically uniaxial positive, $\epsilon = 1.543$, $\omega = 1.528$. In thin section, colorless or pleochroic from yellow-green to colorless (absorption $E > O$). Single-crystal studies gave hexagonal symmetry, space group $P6_222$, with $a = 12.843(3)$, $c = 32.239(8)$ Å from powder data (Cu radiation, diffractometer). Strongest lines in the pattern (52 given) are 4.842(40,106), 3.711(100,300), 3.314(80,216), 3.035(20,312), 2.988(16,224), 2.687-(25,00.12), 2.470(16,406), and 2.139(25,330).

The mineral occurs at the Malaya Bystraya and Tultuy lazurite deposits south of Lake Baikal, Russia. At the Malaya Bystraya deposit, tounkite is present in diopside-lazurite rocks and generally replaced lazurite; at the Tultuy deposit, tounkite forms columnar crystals up to 1 cm long in lazurite calciphyres in association with calcite, diopside, pyrite, and apatite. The new name is for the Tunka Valley, which is located near the two deposits. Samples have been deposited in the Fersman Mineralogical Museum, Moscow, and in the Mineralogical Museum of Saint Petersburg University.

Discussion. Conventional transliteration of the Cyrillic would have given tunkite rather than tounkite, and the name should be pronounced toonkite in English. The cancrinite-like minerals cited by the authors (davyne, liottite, afghanite, franzinite, giuseppettite, sacrofanite, and tounkite), differ mainly in their c parameter. The most important chemical differences among these minerals are the relative proportions of the anions SO_4, OH, Cl, and CO_3 and the amounts of zeolitic H_2O. The authors note that afghanite also occurs in lazurite deposits, but never with tounkite. **E.S.G.**

Al-rich intermetallic compounds

L.I. Khamrabayeva, T.S. Timofeyeva, R.G. Yusupov (1990) Native aluminum and aluminum-based intermetallic compounds in explosion pipes of alkalic basaltic rocks. Doklady Akad. Nauk Uzbekistan SSR, 1990(3), 47–49 (in Russian).

Average electron microprobe analyses of three different phases gave Al 97.73, 56.42, 57.41, Si 1.04, 7.43, 12.86, Cu 0.89, 1.80, –, Ag 2.66, 1.42, –, Mn –, 5.88, 0.92, Fe –, 22.94, 25.30, sum 102.32, 95.89, 96.49 wt%, corresponding to (metal $\Sigma = 1$) $Al_{0.98}Si_{0.01}Cu_{0.004}Ag_{0.007}$, $Al_{0.72}Si_{0.09}Cu_{0.01}Ag_{0.005}Mn_{0.04}Fe_{0.14}$, and $Al_{0.70}Si_{0.15}$-$Mn_{0.005}Fe_{0.15}$. The minerals form a 5 × 1 cm segregation resembling an icicle. Color is gray, from oxidation, and the surface is covered by a duller film; metallic luster, soft, malleable, no cleavage, nonmagnetic; insoluble in acids but reacts with soda; $H = 133$ kg/mm² for phase 1 and 377 kg/mm² for phase 2. In reflected light, the three phases appear as follows: (1) light gray ($\approx70\%$ reflectivity), (2) darker ($\approx30–32\%$ reflectivity), and (3) darkest gray with a dim brownish tint ($\approx22–25\%$ reflectivity). No bireflectance, isotropic. Occurs in altered olivine-leucite basalts in the Koshmansaya area, Kuramin Ridge, Uzbekistan. Associated minerals are spinel, corundum, almandine, and moissanite.

Discussion. No X-ray diffraction data are given to indicate whether the Fe-rich or Si-rich phases differ from native aluminum. **E.S.G.**

Tetragonal $Cu^+_{1.96}S$

I.F. Gablina (1992) A tetragonal polymorph of copper (1) sulfide in natural ores. Doklady Akad. Nauk, 323, 1170–1173 (in Russian).

An electron microprobe analysis gave Cu 79.59, S 20.45, Fe 0.01, Ag 0.06, sum 100.11 wt%, corresponding to $Cu_{1.965}S$. By analogy with synthetic material, the symmetry is inferred to be tetragonal, possibly space group $P4_322$. From the powder pattern (Fe$K\alpha$ radiation, 57-mm camera) $a = 4.008$, $c = 11.23$ Å; strongest lines (18 given, including seven that overlap with chalcocite lines) are 2.703(80), 2.292(60), 1.998(50, overlap with chalcocite), 1.965(100, overlap with chalcocite), 1.875(100, overlap with chalcocite), 1.399(60), and 1.324(40). The mineral was found in three specimens of chalcocite from bornite-chalcocite ore of the Mayak mine in the magmatic Cu-Ni Talnakh deposit, Noril'sk area, Russia. In reflected light the chalcocite appears homogeneous and is gray-white with a pale blue tint. The tetragonal modification was estimated from X-ray data to constitute 5–15% of the specimen. The tetragonal modification was present after storage at room temperature for several years

but disappeared after >6 yr of similar storage following the study. **E.S.G.**

Hollandite-type mineral

N.B. Bolotina, M.T. Dmitrieva, R.K. Rastsvetaeva (1992) Modulated structures of a new natural representative of the hollandite series. Soviet Phys. Crystallogr., 37(3), 311–315.

M.T. Dmitrieva, R.K. Rastsvetaeva, N.B. Bolotina, M.I. Novgorodova (1992) Crystallochemistry of a natural Ba-(Ti,V,Cr,Fe,Mg,Al)-hollandite. Doklady Akad. Nauk, 325(5), 1021–1025 (in Russian).

Electron microprobe analysis gave BaO 21.8, TiO$_2$ 57.9, Fe$_2$O$_3$ 2.0, Cr$_2$O$_3$ 3.6, V$_2$O$_3$ 12.5, Al$_2$O$_3$ 0.6, MgO 0.6, K$_2$O 0.30 wt%, corresponding to $(Ba_{1.14}K_{0.05})_{\Sigma1.19}$ $(Ti_{5.81}V_{1.34}Cr_{0.36}Fe_{0.20}Mg_{0.16}Al_{0.09})_{\Sigma7.98}\cdot(O,OH)_{16}$. Single-crystal X-ray structure study (R = 0.0428) indicated tetragonal symmetry, four-dimensional space group $P(I4:$ 1), a = 10.071(4), c = 14.810(3) Å, Z = 5. Strongest lines of the powder pattern (eight lines given, to d = 1.681) are 3.55(80,220), 3.21(100,310), 2.48(100,211), 2.257-(70,240), 2.220(90,301), and 1.877(70,411). Occurs in equant or elongate grains to 0.8 mm in the Tuvish diatreme, southern Tien Shan.

Discussion. Differs from mannardite (Ba·H$_2$O)-(Ti$_6$V$_2$)O$_{16}$, ankangite Ba(Ti,V)$_8$O$_{16}$, and other hollandite-type minerals, most notably in the size of the unit cell. **J.L.J.**

Fe$_5$Si$_2$, ferdisilicite

Xiongjian Hu (1991) A preliminary study on ferrosilicium from the Proterozoic, southwestern Zhejiang Province. Acta Mineral. Sinica, 11(3), 285–289 (in Chinese, English abs.).

Heavy mineral concentrates prepared from various Proterozoic metamorphic rocks in Longquan, southwestern Zhejian Province, China, gave up to 11.5 g/t Fe silicides, mainly ferdisilicite (FeSi$_2$) with minor xifengite (FeSi$_3$) and ferrosilicium (a mixture). The grains typically have an irregular to a diamond shape and are 0.1–0.4 mm in diameter. Color is steel gray, streak black, metallic luster, opaque, nonmagnetic, no cleavage, conchoidal fracture; in reflected light, grayish white, high reflectance, distinct anisotropism. In addition to Fe and Si, electron microprobe analyses showed the presence of various amounts (up to 1.45 wt%) of Mn, Al, Ti, Ce, and Eu. One grain gave a composition of Fe 79.68, Si 16.83, Mn 1.03, Al 1.29, Ce 1.19, sum 100.02 wt%, corresponding to Fe$_{4.77}$Mn$_{0.07}$Al$_{0.17}$Si$_2$, ideally Fe$_5$Si$_2$.

Four microprobe analyses of the phase referred to as ferdisilicite gave Si 50.83, 49.49, 51.11, 49.07, Fe 47.48, 47.82, 48.49, 49.42, Mn 0.33, 0.69, –, 0.61, Al 1.35, 2.91, –, –, Ce –, –, –, 0.53, Eu –, –, –, 0.36, sum 99.99, 100.01, 100.00, 99.99 wt%, corresponding to Fe$_{0.94}$Mn$_{0.01}$Al$_{0.06}$Si$_2$,

Fe$_{0.97}$Mn$_{0.01}$Al$_{0.12}$Si$_2$, Fe$_{0.95}$Si$_2$, and Fe$_{1.01}$Mn$_{0.01}$Si$_2$. The origin of the silicides is attributed to meteorite-impact events in Archean time.

Discussion. The analyses for ferdisilicite are in good agreement with the ideal formula FeSi$_2$, and the distinct anisotropism reported above is in accord with the tetragonal [not cubic, as in the *Glossary of Mineral Species* (Fleischer and Mandarino, 1991)] symmetry assigned in the original description. Thus the phase abstracted in *Am. Mineral.* (77, p. 212, 1992), which approximates FeSi$_2$ in composition and has X-ray powder data in reasonable agreement with those of synthetic tetragonal FeSi$_2$ (PDF 35–822), seems to be ferdisilicite. Insufficient data are available to conclude whether the phase of composition FeSi$_{2.26-2.39}$, referred to as leboite and abstracted in *Am. Mineral.* (76, 301–302, 1991), is the same as ferdisilicite. **J.L.J.**

Ca-Ce fluorocarbonates

Xiuling Wu, Guangming Yang, Zhaolu Pan, Xianhua Wang (1991) Lattice image study of new regular mixed-layer minerals in the calcium-cerium fluorocarbonate mineral series. Acta Mineral. Sinica, 11(3), 193–199 (in Chinese, English abs.).

Electron diffraction and lattice image techniques applied to fluorocarbonate minerals revealed the presence of a mixed-layer phase of the type B$_3$S$_2$ (B = bastnäsite, S = synchysite) and nine regular mixed-layer polytypes of the type B$_m$S$_n$ ($m \geq n$). The phases are characterized in terms of cell dimensions, stacking, and the ratio CaCO$_3$: CeCO$_3$F. No chemical data are given. **J.L.J.**

Y-Ca carbonate

I.Ya. Nekrasov, A.I. Gorshkov, O.A. Doynikova, R.A. Nekrasova, A.V. Sivtsov, Ye.V. Vlasova (1992) A new hydrous yttrium-calcium carbonate from the Tommot deposit in northeastern Yakutia. Doklady Akad. Nauk, 326, 883–886 (in Russian).

Four electron microprobe analyses gave Ca 14.08, 14.01, 14.04, 13.01, Y 18.86, 18.58, 19.36, 18.83, Ce 0.13, 0.17, 0.12, –, Nd 0.60, 0.65, 0.61, 0.68, Sm 0.87, 0.76, 0.75, 0.89, Gd 2.30, 2.27, 2.23, 2.57, Dy 4.43, 4.28, 4.44, 5.58, Er 3.29, 3.27, 3.37, 3.42, Tm 0.21, 0.22, 0.27, 0.33, Yb 1.80, 1.70, 1.96, 2.13, Lu 0.01, 0.03, 0.06, –, Fe 0.13, 0.09, 0.04, –, P 0.24, 0.26, 0.26, 0.22, O 13.11, 13.26, 13.45, 12.87, sum 60.24, 59.52, 60.96, 60.53 wt%. The presence of CO$_2$, OH, and H$_2$O was established from the infrared spectrum, which contains absorption features at 450, 600, 720, 775, 890, 1050, 1100, 1430, 1520, 1670, ≈3400 (broad), and 3505 cm^{-1}. On the basis of the microprobe data and infrared spectrum, the formula Ca$_4$(Y$_{0.8}$REE$_{0.2}$)$_3$(CO$_3$)$_8$(OH)·2H$_2$O is proposed. The mineral forms white spherulites up to 2 mm across, and reniform encrustations consisting of oolites 100–500 μm

across. The oolites are yellowish at the core, with a gradual transition to a white crust 5–50 μm thick. The oolites consist of subparallel blocks 100–500 Å across. $H = 4$–4.5, $D_{meas} = 3.96(4)$ g/cm^3 by a capillary method. Optically biaxial negative, nonpleochroic, $\alpha' = 1.672$, $\gamma' = 1.758$, weak dispersion. From electron diffraction, symmetry is inferred to be tetragonal, space group $P4_2/m$, $P4_2$, or $P4_222$, $a = 7.44$, $c = 10.92$ Å. The powder X-ray pattern has four lines with intensity >40 or that are sufficiently sharp to be resolved (remaining lines are not specified): 6.13(80), 3.53(90 broad), 2.73(50), and 1.888(100 broad). The mineral occurs in thin crusts (0.5–2 mm), inferred to be supergene, that line fractures of oxidized chevkinite-monazite-britholite ores in the Tommot deposit, Indigirki River area, northeastern Yakutia, Russia.

Discussion. The proposed formula $Ca_4(Y_{0.8}REE_{0.2})_3$-$(CO_3)_8(OH) \cdot 2H_2O$ is not consistent with the data reported in this paper. The measured Y/ΣREE = 2.21–2.57 (vs. 4 in the formula), and Ca/(Y + ΣREE) = 1.05–1.20 (vs. 1.33 in the formula). Totals calculated for this formula (assuming Fe + Ca + P + Y + ΣREE = 7, and O = 27) are 95.87–97.94 wt%. Assuming a cell volume of 604.46 Å^3 and molecular weight of 1004.906 (average for REE_2O_3 taken as 375), the density calculated from the proposed formula is a multiple of 2.76 g/cm^3 [vs. $D_{meas} = 3.96(4)$ g/cm^3]. **E.S.G.**

$Na_{25}BaREE_2(CO_3)_{11}(HCO_3)_4(SO_4)_2F_2Cl$

N.A. Yamnova, D.Yu. Pushcharovskii, S.V. Vyatkin, A.P. Khomyakov (1992) Crystal structure of the new native sulfate-carbonate $Na_{25}BaTR_2(CO_3)_{11}(HCO_3)_4$-$(SO_4)_2FCl$. Soviet Phys. Crystallogr., 37(6), 753–756.

Single-crystal X-ray structure study ($R = 0.037$) indicated hexagonal symmetry, space group $P6_3/m$, $a = 8.811(7)$, $c = 37.03(3)$ Å. The most probable statistical filing of the REE position is $Y_{0.55}Gd_{0.25}Dy_{0.20}$. The mineral occurs in interstices as irregular grains up to 1 cm among potassium feldspar crystals in pegmatites of the Lovozero massif, Kola Peninsula, Russia. Yellow-green color, transparent, vitreous luster, perfect {0001} cleavage, $H = \sim 4$, soluble with effervescence in dilute acids, $D_{meas} = 2.85$, $D_{calc} = 2.87$ g/cm^3 for $Z = 2$. Other associated minerals are nahcolite, trona, thermonatrite, sidorenkite, and neighborite. **J.L.J.**

REE analogue of hilairite

R.K. Rastsvetaeva, A.P. Khomyakov (1992) Crystal structure of a rare-earth analog of hilairite. Soviet Phys. Crystallogr., 37(6), 845–847.

Electron microprobe results (analysis not given) correspond to $Na_{4.34}K_{0.57}(Y_{0.69}REE_{0.17})(Zr_{0.65}Ti_{0.20}Nb_{0.11})Si_6O_{18} \cdot$ 6H$_2$O. Single-crystal X-ray structure study ($R = 0.034$) indicated hexagonal symmetry, space group $R32$, $a = 10.825(5)$, $c = 15.809(4)$ Å, $D_{meas} = 2.67$, $D_{calc} = 2.73$ g/cm^3 for $Z = 3$. The X-ray powder pattern is stated to be similar to that of hilairite. Occurs as colorless, equant, well-faceted crystals in the Khibiny alkaline massif, Russia. **J.L.J.**

New Data

Akatoreite

P.C. Burns, F.C. Hawthorne (1993) Edge-sharing $Mn^{2+}O_4$ tetrahedra in the structure of akatoreite, Mn_9^{2+}-$Al_2Si_8O_{24}(OH)_8$. Can. Mineral., 31, 321–329.

Single-crystal X-ray structure study ($R = 0.029$) of akatoreite indicated triclinic symmetry, space group $P\bar{1}$, $a = 8.337(2)$, $b = 10.367(2)$, $c = 7.629(1)$ Å, $\alpha = 104.96(1)$, $\beta = 93.81(2)$, $\gamma = 104.18(1)°$, $Z = 1$, and the revised formula as given above. **J.L.J.**

Clinomimetite

Yongshan Dai (1993) Clinomimetite: The history and substantiation of the natural monoclinic dimorph of mimetite. Mineral. Record, 24, 307–310.

The mineral occurs as greenish yellow barrel-shaped or short prismatic crystals, elongate [001], at Johanngeorgenstadt, Germany, and as white, transparent, spindle-shaped grains at Eureka, Utah. $H = 4$, $D_{meas} = 7.36(1)$, $D_{calc} = 7.37$ g/cm^3. Optically biaxial negative, $2V = 8°$, refractive indices similar to those of mimetite; orientation probably $X = c$, $Y \wedge b$ or $Z \wedge b = 29.88°$. The X-ray powder pattern (114-mm Gandolfi, CuKα radiation) is indistinguishable from that of mimetite. The average of ten electron microprobe analyses corresponds to $Pb_{9.99}[As_{5.74}Si_{0.07}S_{0.06}P_{0.14}]_{\Sigma6.01}Cl_{2.18}O_{23.91}$; the absence of Ca in clinomimetite and its apparent consistent presence (0.4–1.4 wt% Ca) in mimetite may be a useful distinguishing criterion.

Discussion. The original incomplete description was abstracted in *Am. Mineral.* (76, p. 2021, 1991). **J.L.J.**

Dietzeite

P.C. Burns, F.C. Hawthorne (1993) The crystal structure of dietzeite, $Ca_2H_2O(IO_3)_2(CrO_4)$, a heteropolyhedral framework mineral. Can. Mineral., 31, 313–319.

Single-crystal X-ray structure study ($R = 0.028$) indicated monoclinic symmetry, space group $P2_1/c$, $a = 10.118(1)$, $b = 7.238(1)$, $c = 13.965(2)$ Å, $\beta = 106.62(1)°$, $D_{calc} = 3.822$ g/cm^3 for $Z = 4$ and the new formula as given above. **J.L.J.**