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NEW MINERAL NAMES*

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Native brass

M.G. Chebotarev, G.M. Chebotarev (1990) Native brass in gold sulfide ore deposits in Central Kyzylkum. Uzbek. Geol. Zh., 1990(3), 39–41 (in Russian).

Analysis of the mineral by electron microprobe gave (average of four, range) Cu 61.30, 54.98–67.87; Zn 38.93, 34.72–43.59; Fe 1.97, 0–4.06; sum 102.20 wt%, corresponding to $Cu_{1.81}Fe_{0.07}Zn_{1.12}$. Both α-type and α-β-type forms of brass are present. Greenish yellow in reflected light. The mineral occurs as microscopic inclusions in pyrite from late-stage quartz-pyrite veins that cut Au-bearing pyrite deposits in western Uzbekistan. Pyrrhotite and graphite-like carbonaceous material are associated with the brass. A final note claims that contamination during production of polished thin sections cannot be ruled out as the source of the "native brass." **D.A.V.**

Cheremnykhite*, kuksite*

A.A. Kim, N.V. Zayakina, V.F. Makhotko (1990) Kuksite $Pb_3Zn_3TeO_6(PO_4)_2$ and cheremnykhite $Pb_3Zn_3TeO_6(VO_4)_2$—New tellurates from the Kuranakh gold deposit (Central Aldan, southern Yakutia). Zapiski Vses. Mineral. Obshch., 119(5), 50–57 (in Russian).

Cheremnykhite

Analysis by electron microprobe (average of ten) gave PbO 53.04, ZnO 18.89, TeO_3 13.76, V_2O_5 9.25, P_2O_5 0.06, As_2O_5 2.02, Sb_2O_5 0.06, SiO_2 2.16, sum 99.24 wt%, corresponding to $Pb_{3.03}Zn_{2.97}Te_{1.00}V_{1.30}As_{0.22}P_{0.01}Si_{0.46}O_{13.77}$, ideally $Pb_3Zn_3TeO_6(VO_4)_2$. X-ray study (single crystal and powder diffraction) showed the mineral to be orthorhombic, space group *Cmmm, C*222, *Cm*2*m,* or *Cmm*2, $a = 8.58(3)$, $b = 14.86(5)$, $c = 5.18(3)$ Å, $Z = 2$, $D_{calc} = 6.44$ g/cm³. The strongest lines (20 given) are 3.30(100,131,201), 3.00(90,221,041), 2.470(40,060,330), 1.903(50,242,152,312), and 1.607(60,352,422,177). The mineral occurs as elongate tabular crystals, 0.1 to 0.5 mm, with well-developed {100} and {010}. Occurs with kuksite, dugganite, yafsoanite, descloizite, and Te-Pb-Mn-saponite as a late-stage interstitial mineral in calcite at the Kuranakh gold deposit, Central Aldan. In hand specimen the mineral is greenish yellow, transparent in transmitted light, white streak, adamantine luster, no fluorescence, brittle, microhardness (10-g load) = 673 kg/cm², perfect cleavage. Optically biaxial negative, $2V = 20°$, $\alpha = 1.986(5)$, $\gamma = 1.997(5)$, positive elongation, dispersion $r > v$, no pleochroism, $X = a$, $Y = b$, $Z = c$.

The name is for I. M. Cheremnykh, one of the discoverers of the Kuranakh deposit. Type material is at the Institute of Geological Sciences Museum, Yakutsk Science Center, Siberian Branch, USSR Academy of Sciences.

Kuksite

Analysis by electron microprobe (average of nine) gave PbO 50.59, ZnO 20.76, CaO 1.46, TeO_3 14.30, P_2O_5 10.38, V_2O_5 1.81, As_2O_5 0.07, SiO_2 0.40, sum 99.77 wt%, corresponding to $Pb_{2.68}Zn_{3.01}Ca_{0.31}Te_{0.96}P_{1.73}V_{0.23}Si_{0.08}O_{13.94}$, ideally $Pb_3Zn_3TeO_6(PO_4)_2$. X-ray study (single crystal and powder diffraction) showed the mineral to be orthorhombic, space group *Cmmm, C*222, *Cm*2*m*, or *Cmm*2, $a = 8.50(3)$, $b = 14.72(5)$, $c = 5.19(3)$ Å, $Z = 2$. $D_{calc} = 6.21$ g/cm³. The strongest lines (17 given) are 3.29(100,131,201), 3.00(80,221,041), 2.594(40,002), 1.903(50,242,152,312), and 1.606(30,352,422,177). Occurs as thin tabular crystals, 0.1 to 0.3 mm, with {100} well developed, associated with cheremnykhite, dugganite, yafsoanite, descloizite, and Te-Pb-Mn-saponite, as a late-stage interstitial mineral in calcite of the Kuranakh gold deposit, Central Aldan. In hand specimen the mineral is gray and turbid, and transparent in transmitted light. White streak, adamantine luster, weak fluorescence, brittle, microhardness (10-g load) = 325 kg/cm², perfect cleavage. Optically biaxial negative, $2V = 12–20°$, $\alpha = 1.971(5)$, $\gamma = 1.981(5)$, positive elongation, dispersion $r > v$, $Z = c$, no pleochroism.

The name is for A. I. Kuks, one of the discoverers of the Kuranakh deposit. Type material is at the Institute of Geological Sciences Museum, Yakutsk Science Center, Siberian Branch, USSR Academy of Sciences. **D.A.V.**

Dmisteinbergite*

B.V. Chesnokov, E.V. Lotova, E.N. Nigmatulina, V.S. Pavlyuchenko, A.F. Bushmakin (1990) Dmisteinbergite $CaAl_2Si_2O_8$ (hexagonal)—A new mineral. Zapiski Vses. Mineral. Obshch., 119(5), 43–45 (in Russian).

Analysis of the mineral by electron microprobe (average of four) gave Na_2O 0.32, K_2O 0.03, MgO 0.01, CaO

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* Before publication, minerals marked with an asterisk were approved by the Commission on New Minerals and Mineral Names, International Mineralogical Association.

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19.29, Al_2O_3 35.39, SiO_2 43.89, sum 98.93 wt%, corresponding to $(Ca_{0.96}Na_{0.03})_{\Sigma 0.99}Al_{1.95}Si_{2.05}O_{8.00}$, ideally $CaAl_2Si_2O_8$. The mineral decomposes slowly in HCl. X-ray study showed the mineral to be hexagonal, space group *P6/mmm*, a = 5.122(5), c = 14.781(5) Å, $Z = 2$, D_{calc} = 2.747 g/cm³. The strongest lines (seven given) are 4.48(60,100), 3.83(60,102), 3.73(100,004), 2.85(70,104), 2.57(80,110), and 1.847(70,008). The mineral forms hexagonal tablets up to 0.7 mm across on fracture surfaces in blocks from burned coal dumps in the Chelyabinsk coal basin, southern Ural mountains. It is associated with cordierite, mullite, anorthite, wollastonite, tridymite, fayalite, fassaite, norbergite-chondrodite, graphite, and iron carbides and monosulfides. Crystals exhibit a well-developed {001} pinacoid and a poorly developed {1010} prism. Colorless, perfect {0001} cleavage, $H = 6$. Optically uniaxial positive, $\omega = 1.575$, $\epsilon = 1.580$.

The name is for Dmitrii Steinberg, a noted petrologist. Type material is at the Fersman Mineralogical Museum, Moscow. **D.A.V.**

Haynesite*

M. Deliens, P. Piret (1991) Haynesite, uranyl selenite hydrate, a new mineral species from the Repete mine, San Juan County, Utah. Can. Mineral., 29, 561–564 (in French, English abstract).

Electron-microprobe and CHN analyses gave, after subtraction of 1.51 wt% calcite (0.85% CaO), UO_3 71.81, SeO_2 17.91, H_2O 8.56, sum 98.28 wt%, corresponding to $3.03UO_3 \cdot 1.95SeO_2 \cdot 5.75H_2O$, ideally $(UO_2)_3(OH)_2(SeO_3)_2 \cdot 5H_2O$. Occurs as amber-yellow tablets, transparent to translucent, elongate [001], and as acicular prismatic rosettes to 3 mm in diameter; vitreous luster, H = 1.5–2, easy {010} cleavage, yellowish green fluorescence, D_{meas} = 4.1, D_{calc} = 4.07 g/cm³ with $Z = 2$. Optically biaxial negative $\alpha = 1.618(2)$, $\beta = 1.738(3)$, $\gamma = 1.765(5)$, $2V_{meas} = 45°$, $2V_{calc} = 48°$, $X = a$, $Y = b$, $Z = c$. Pleochroic from pale yellow to bright yellow. X-ray single-crystal study indicated orthorhombic symmetry, space group *Pnc*2 or *Pncm*, a = 8.025(5), b = 17.43(1), c = 6.935(3) Å. Strongest lines (32 given) of the powder pattern are 8.01(100,100), 4.01(70,200), 3.468(60,002), 3.186 (50,102), 3.119(70,051), 2.912(80,151), and 2.471 (40,251).

The mineral is associated with andersonite, boltwoodite, gypsum, and calcite as crusts on mudstones and sandstones of the Morrison Formation at the Repete mine near Blanding, Utah. The new name honors Patrick Haynes, the United States geologist who first collected the mineral. Type material is in the Institut royal des Sciences naturelles de Belgique at Brussels, Belgium. **J.L.J.**

Jolliffeite*, unnamed CoAsSe

L.J. Cabri, J.H.G. Laflamme, A.C. Roberts, A.J. Criddle, L.J. Hulbert (1991) Jolliffeite and unnamed CoAsSe: Two new arsenoselenides from the north shore of Lake Athabasca, Saskatchewan. Can. Mineral., 29, 411–418.

Jolliffeite

Electron-microprobe analysis (one of seven analyzed grains) gave Ni 23.2, Co 5.1, Fe 0.06, Cu 0.09, As 36.6, Se 36.6, S 0.08, sum 101.13 wt%, corresponding to $(Ni_{0.83}Co_{0.18})_{\Sigma 1.01}As_{1.01}(Se_{0.97}S_{0.01})_{\Sigma 0.98}$, ideally NiAsSe. Occurs as anhedral grains up to 145 × 240 μm, typically rimmed by clausthalite. In reflected light, white, not bireflectant or pleochroic; representative reflectance measurements (percent), given in 20-nm steps for air and for oil, are (nm, R_1, R_2 in air) 420 50.3, 50.6; 460 50.7, 50.8; 500 50.9, 51.0; 540 51.5, 51.5; 580 51.2, 51.3; 620 51.4, 51.4; 660 51.4, 51.3. X-ray single-crystal study indicated cubic symmetry, space group *Pa*3, a = 5.831(1) Å, D_{calc} = 7.12 g/cm³ with the ideal formula, and $Z = 4$. The X-ray powder pattern (nine lines given) has strongest lines of 2.916(50,200), 2.602(100,210), 2.378(80,211), 1.757(80,311), and 1.559(50,321).

The new mineral, which is chemically and crystallographically the Se analogue of gersdorffite-*Pa3*, is associated with pitchblende in drill core of a fracture zone near a dolomite-peridotite contact at Fish Hook Bay, Shirley Peninsula, on the north shore of Lake Athabaska near Uranium City, Saskatchewan. The new name is for A. W. Jolliffee (1907–1988), Queen's University, Kingston. Type material is in the Systematic Reference Series of the National Mineral collection, Geological Survey of Canada, Ottawa.

CoAsSe

Occurs with jolliffeite as grains of similar size, habit, and association. Electron-microprobe analyses of two grains gave Co 23.6, 17.8; Ni 5.1, 10.3; Fe 0.27, 0.18; As 37.7, 33.2; Se 32.8, 39.1; S 1.1, 0.9; sum 100.57, 100.67 wt%, corresponding to $(Co_{0.83}Ni_{0.18}Fe_{0.01})_{\Sigma 1.02}As_{1.05}(Se_{0.86}S_{0.07})_{\Sigma 0.93}$ and $(Co_{0.64}Ni_{0.37}Fe_{0.01})_{\Sigma 1.02}As_{0.93}(Se_{1.04}S_{0.01})_{\Sigma 1.05}$, ideally CoAsSe. In reflected light, white, slightly anisotropic (gray rotation tints). Reflectance measurements, as for jolliffeite, are 420 49.45, 51.0; 460 50.2, 51.2; 500 50.8, 51.6; 540 51.2, 51.8; 580 51.4, 51.9; 620 51.5, 51.9; 660 51.5, 51.9. An X-ray single crystal-type mount showed that the mineral is cryptocrystalline. Strongest lines of the powder pattern (13 lines listed) are 2.592(100), 2.365(80), 1.746(60), and 1.547(40) Å. The pattern is not similar to that of cobaltite or synthesized CoAsSe. **J.L.J.**

Lunijianlaite*

Youhua Kong, Xiuwen Peng, Dehui Tian (1990) Lunijianlaite—A new regular interstratified mineral. Acta Mineral. Sinica, 10(4), 289–298 (in Chinese, English abstract).

Electron-microprobe, TG (for H_2O), and atomic-absorption spectrographic analyses (for Li) gave Na_2O 0.063, K_2O 0.012, Li_2O 1.57, Fe_2O_3 0.60, Al_2O_3 44.80, SiO_2

41.61, H_2O^+ 11.296, sum 99.951 wt%; the mineral consists of regular 1:1 interstratifications of cookeite and pyrophyllite, and the bulk analysis contains additional discrete cookeite. The calculated ideal formula corresponds to $(Li_{0.732}Al_{4.189})(Si_3AlO_{10})(OH,O)_8 \cdot Al_2(Si_4O_{10})(OH)$, the two parts representing cookeite and pyrophyllite layers, respectively, simplified as $Li_{0.732}Al_{6.189}(Si_7AlO_{20})(OH,O)_{10}$. An electron-diffraction pattern (used in combination with energy-dispersion analyses to determine Al/Si ratios) gave $a = 5.09$, $b = 8.97$, and from the powder pattern $c \sin \beta = 23.397$ Å. A lattice fringe image gave $d(001) = 23.4$ Å. The mineral shows only $00l$ diffraction lines, but all orders are present, and of similar width, to $l = 18$, indicating excellent regular stratification. Individual lunijianlaite domains are about 200 Å thick. Strongest lines of the X-ray powder pattern (all patterns contain some cookeite–CO) are 14.267(22, 001 CO), 11.788(15,002), 7.802(22,003), 4.704(100,005; 003 CO), 3.899(8,006), 3.539(45, 004 CO), 3.343(47,007), 2.919(40,008), and 2.832(22, 005 CO). The coefficient of variation is 0.313.

Individual crystals are acicular to 2 mm in length, generally 0.4–1.2 mm, and occur as radiating aggregates 0.8–2.0 mm in diameter. Colorless to white, transparent, pearly to vitreous luster (silky in aggregates), $H = 2$, perfect {001} cleavage, $D_{meas} = 2.75$ g/cm³. Optically colorless, transparent, undulatory extinction that is parallel in most grains and inclined 2–6° in a few; biaxial negative, $\alpha = 1.576(5)$, $\beta = 1.582(5)$, $\gamma = 1.587(5)$, $2V = 60(5)°$.

The mineral occurs at Qingtian, Zhejiang Province, China, in bluish spheres of corundum in a pyrophyllite deposit formed in rhyolite by hydrothermal fluids of volcanic origin. Diaspore occurs at some of the contacts between corundum and lunijianlaite. Other coexisting minerals are chlorite, illite, halloysite, svanbergite, zeolites, and specular hematite. The name is according to the Chinese and IMA nomenclature systems for regularly stratified minerals: in Chinese, the names of the two mineral members are separated by *jian,* signifying their alternation. The IMA suggests that group rather than species names be used; hence, *luni* for the chlorite group, representing cookeite, and *jian* with pyrophyllite.

Discussion. The repository for type material is not given. For a discussion of the nomenclature of regularly interstratified minerals, see Bailey, *Am. Mineral.,* 67, 394–398, 1982. **J.L.J.**

Makarochkinite

O.V. Yakubovich, Yu.A. Malinovskii, O.V. Polyakov (1990) Crystal structure of makarochkinite. Kristallografiya, 35, 1388–1394 (in Russian, English translation in Soviet Phys. Crystallogr., 35, 818–822).

Single-crystal X-ray structural study ($R = 0.0297$) of a crystal from the type locality, a granite pegmatite in "mine 400" of the Il'menskii National Forest, gave triclinic symmetry, space group $P\bar{1}$, $a = 10.352(5)$, $b = 10.744(3)$, $c = 8.864(4)$ Å, $\alpha = 105.73(3)$, $\beta = 96.16(3)$, $\gamma = 124.91(3)°$. Chemical analysis [see *Discussion*] gave SiO_2 30.09, TiO_2 6.02, Al_2O_3 3.55, Fe_2O_3 11.12, FeO 26.91, BeO 2.32, MnO 1.26, MgO 2.74, CaO 13.38, Na_2O 1.35, K_2O 0.30, H_2O^- 0.07, H_2O^+ 0.35, LOI 0.22, sum 100.28 wt%, corresponding to $(Ca_{2.09}Na_{0.38}K_{0.03})_{\Sigma 2.50}$-$(Fe^{2+}_{3.29}Fe^{3+}_{1.22}Ti^{4+}_{0.66}Mn_{0.08}Mg_{0.30})_{\Sigma 5.55}(Si_{4.39}Be_{0.81}Al_{0.61})_{\Sigma 5.81}$-$O_{20}$. The structural formula is $(Ca_{1.75}Na_{0.25})_{\Sigma 2.00}$-$(Fe^{2+}_{3.80}Fe^{3+}_{1.35}Ti^{4+}_{0.60}Mg^{2+}_{0.25})_{\Sigma 6.00}(Si_{4.4}Be_{1.0}Al_{0.6})_{\Sigma 6.0}O_{20}$. $D_{meas} = 3.88$, $D_{calc} = 3.92$ g/cm³ with $Z = 2$. The structure indicates that the mineral belongs to the aenigmatite group.

Discussion. The description, analysis, and new name were reported in the book *New Little-studied Minerals and Mineral Associations of the Ural* by V. O. Polyakov, G. E. Cherepivskaya, and E. P. Shcherbakova, *Izd. Ukr. Nauchnyi Tsentr. Akad. Nauk SSR,* which has not been accessible. The origin of the name is uncertain, and the mineral has not been approved by the CNMMN. **J.L.J.**

Manganotychite*

A.P. Khomyakov, A.Yu. Bakhchisaraitsev, A.V. Martynova, T.M. Parashchenko (1990) Manganotychite $Na_6Mn_2(SO_4)(CO_3)_4$—A new mineral. Zapiski Vses. Mineral. Obshch., 119(5), 46–49 (in Russian).

Analysis of the mineral by wet chemistry, adjusted by subtracting 3.8 wt% of intermixed shortite, gave Na_2O 32.21, MnO 15.00, FeO 6.00, MgO 1.98, CO_2 30.68, SO_3 14.13, sum 100.00 wt%, corresponding to $Na_{5.99}$-$Mn_{1.22}Fe_{0.48}Mg_{0.28}S_{1.02}C_{4.02}O_{16.08}$, ideally $Na_6(Mn,Fe,Mg)_2(SO_4)(CO_3)_4$. Assignment of all CaO to intermixed shortite is justified because electron-microprobe analysis of a clear crystal revealed no CaO. The IR spectrum shows characteristic absorption peaks for sulfate (635, 1120 cm⁻¹) and carbonate (713, 880, 1450 cm⁻¹). The DTA curve shows endothermic peaks at 380, 440, and 750 °C, corresponding to two dissociation steps followed by melting. The mineral effervesces in various weak acids and dissolves slightly in cold water, with development of a brown coating. The X-ray diffraction pattern is nearly identical to that of ferrotychite. Thus, manganotychite is cubic, space group $Fd3$, $a = 13.9951(8)$ Å, $Z = 8$. The strongest lines (37 given) are 4.22(76,311), 2.695(100,333,511), 2.474(70,440), 2.366(27,531), 1.959(28,551,711), and 1.616(28,555,751). The mineral occurs as irregular grains up to 1 cm across and in massive aggregates up to 5 cm across in the core of hyperalkalic pegmatitic veins, 0.3 m wide, at Alluaiv mountain, Lovozero massif, Kola peninsula. Associated minerals (37 listed) include potassium feldspar, cancrinite, aegirine, villiaumite, cryolite, kogarkoite, trona, shortite, and sidorenkite. The mineral is pale pink on fresh surfaces, with dull vitreous luster and conchoidal fracture. $H = 4$, $D_{meas} = 2.70(5)$, $D_{calc} = 2.79$ g/cm³. Weakly magnetic, optically isotropic, $n = 1.544(2)$. The name is for the relationship to tychite and ferrotychite. Type material is at the Fersman Mineralogical Museum, Moscow, and at the Kola Geological Museum, Apatity. **D.A.V.**

Maxwellite*, squawcreekite*

E.E. Foord, P.F. Hlava, J.J. Fitzpatrick, R.C. Erd, R.W. Hinton (1991) Maxwellite and squawcreekite, two new minerals from the Black Range tin district, Catron County, New Mexico, U.S.A. Neues Jahrb. Mineral. Mon., 363–384.

Maxwellite

The mineral occurs as medium to dark red aggregates to 3 mm and as blocky to short prismatic euhedral to subhedral crystals up to 1 mm long, showing {013}, {526}, {$\bar{5}$26}, {011}; medium to pale red-orange streak, vitreous luster, transparent, $H = 5–5.5$, good {110} cleavage, irregular to conchoidal fracture, nonfluorescent, $D_{\text{meas}} = 3.90(2)$, $D_{\text{calc}} = 3.95$ g/cm^3 with $Z = 4$. Slowly soluble in HCl and HNO_3 and readily soluble in hot H_2SO_4. Electron-microprobe analyses (av. of 43; Li_2O by ion microprobe) gave Na_2O 8.0, CaO 8.0, Fe_2O_3 14.0, MgO 3.5, Al_2O_3 5.0, TiO_2 5.0, Mn_2O_3 0.5, SnO_2 0.6, ZnO 0.1, As_2O_5 51.0, ZrO_2 0.3, Nb_2O_5 0.2, Li_2O 0.1, F 6.0, O ≡ F 2.5, sum 99.8 wt%, corresponding to $(Na_{0.59}Ca_{0.33}Li_{0.02})_{\Sigma 0.94}(Fe^{3+}_{0.40}Al_{0.22}Mg_{0.20}Ti_{0.14}Mn_{0.01}Sn_{0.01}Zr_{0.01})_{\Sigma 0.99}(As_{1.01}O_4)(F_{0.72}O_{0.28})_{\Sigma 1.00}$, ideally $NaFe^{3+}(AsO_4)F$. Optically biaxial positive, $\alpha = 1.748(3)$, $\beta = 1.772(3)$, $\gamma = 1.798(3)$ (W light), $2V_{\text{meas}} = 86°$, $2V_{\text{calc}} = 89°$, strong dispersion $r > v$, $X \wedge c = +11°$, $Y = b$, $Z \wedge a = 35.5°$; pleochroism $X = Y$ = medium yellow-orange, Z = dark orangish red, $Z > X = Y$. Single-crystal X-ray study indicated monoclinic symmetry, space group *Aa* or *A*2/*a* (*A*2/*a* by analogy with other members of the tilasite group), $a = 7.161(1)$, $b = 8.780(2)$, $c = 6.687(1)$ Å, $\beta = 114.58(1)°$ as refined from a Guinier-Hägg pattern (Cu$K\alpha_1$ radiation) with strongest lines of 4.844(70,$\bar{1}$11), 3.291(100,$\bar{2}$11), 3.039(75,002), 2.637(50,031), and 2.614(80,220). The new name is for Charles H. Maxwell (U.S. Geological Survey, retired) in recognition of his studies of New Mexico geology. Maxwellite occurs adjacent to hematite-cassiterite veins in rhyolite at Squaw Creek, Catron County, New Mexico, (type locality) and in cavities in rhyolite at Willow Springs Draw, Sierra County, New Mexico. Compositions indicate complete solid solution among durangite $NaAlAsO_4F$, tilasite $CaMgAsO_4F$, and maxwellite. Type material is in the U.S. National Museum, Washington, DC.

Squawcreekite

Occurs as single euhedral, yellow-brown crystals up to 50 × 200 × 200 μm and as radiating clusters to 2 mm across. Typically elongate, also equant to flattened prismatic, showing {100}, {100}, {111}, and {101}. Pale yellow-brown streak, adamantine luster, transparent, $H = 6–6.5$, possible imperfect cleavage on {100}, conchoidal to subconchoidal fracture, nonfluorescent, $D_{\text{calc}} = 6.02–6.06$ g/cm^3 with $Z = 2$. Electron-microprobe analysis of two crystals gave, respectively, Al_2O_3 0.3, 0.4; CaO 0.1, 0.1; TiO_2 8.8, 5.3; Mn_2O_3 0.3, 0.0; Fe_2O_3 19.1, 23.2; Nb_2O_5 0.4, 0.1; SnO_2 34.6, 22.7; Sb_2O_5 38.4, 45.5; sum 101.9, 97.4 wt%, corresponding to $(Fe^{3+}_{0.29}Sb^{5+}_{0.29}Sn_{0.28}Ti_{0.13}Al_{0.01})_{\Sigma 1.00}O_2$ and $(Fe^{3+}_{0.36}Sb^{5+}_{0.35}Sn_{0.19}Ti_{0.08}Al_{0.01})_{\Sigma 0.99}O_2$, ideally $Fe^{3+}Sb^{5+}O_4$. Reflectance values (%, R_o, R_e) are 470 nm 16.9, 17.6; 546 nm 13.9, 16.6; 589 nm 12.5, 15.5; 650 nm 15.1, 18.3. In transmitted light, uniaxial positive, weak dispersion $r > v$, $Z = c$, weakly pleochroic from pale yellow (*O*) to medium yellow-brown (*E*). Single-crystal X-ray study indicated tetragonal symmetry, space group *P*4$_2$/*mnm* (by analogy to cassiterite), $a = 4.6673(7)$, $c = 3.1006(8)$ Å. Strongest lines of the diffractometer pattern (Cu$K\alpha_1$) are 3.3039(100,110), 2.5844(49,101), 2.3342(17,200), 1.7316(36,211), 1.6500(12,220), and 1.3907(10,301).

The new name is for the locality, Squaw Creek, Catron County, New Mexico, at which squawcreekite is associated with maxwellite. Squawcreekite is usually mantled by epitaxial Fe- and Sb-bearing cassiterite that grades outward to normal cassiterite. The new mineral also occurs with cassiterite at the Esperansa tin mine near Durango, Mexico. Type material is in the U.S. National Museum, Washington, DC. **J.L.J.**

Nalipoite*

G.Y. Chao, T.S. Ercit (1991) Nalipoite, sodium dilithium phosphate, a new mineral species from Mont Saint-Hilaire, Quebec. Can. Mineral., 29, 565–568.

T.S. Ercit (1991) The crystal structure of nalipoite. Can. Mineral., 29, 569–573.

The average of six electron-microprobe analyses gave Na_2O 24.54, Al_2O_3 0.06, P_2O_5 51.76, Li_2O 22.12 (calc. from stoichiometry), sum 98.48 wt%, corresponding to $Na_{1.07}Li_2P_{0.99}O_4$. Occurs as anhedral to subhedral blocky grains to 2 mm and as irregular grains to 0.2 mm; white, pale blue, or pale yellow color, white streak, vitreous luster, transparent to translucent, $H = 4$, very brittle, uneven fracture, nonfluorescent; good cleavages {100}, {010}, {001}, {110}, and distinct cleavage possibly {101}; readily soluble in 1:1 HNO_3, less readily in 1:1 HCl, and slowly in 1:1 H_2SO_4. $D_{\text{meas}} = 2.58(1)$, $D_{\text{calc}} = 2.612$ g/cm^3 with the ideal formula and $Z = 4$. Optically biaxial negative, $\alpha = 1.533(1)$, $\beta = 1.540(1)$, $\gamma = 1.541(1)$, $2V_{\text{meas}} = 49(1)°$, $2V_{\text{calc}} = 41°$; $X = a$, $Y = c$, $Z = b$. Gladstone-Dale compatibility is superior. X-ray structural study ($R = 0.025$) indicated orthorhombic symmetry, space group *Pmnb*, $a = 6.884(2)$, $b = 9.976(4)$, $c = 4.927(2)$ Å; strongest lines of the powder pattern (114.6-mm Gandolfi camera, Cu radiation) are 4.02(100,120), 3.507(100,021), 3.441(100,200), 2.493(90,040), and 2.462(90,002), in good agreement with data for synthetic $NaLi_2PO_4$.

The mineral, previously UK63, occurs in sodalite-analcime-microcline xenoliths at the Poudrette quarry in the nepheline syenite of Mount Saint-Hilaire near Montreal, Quebec. The new name alludes to the composition: Na-Li-P-O. Type material is in the Canadian Museum of Nature, Ottawa, and at the Royal Ontario Museum, Toronto, Canada. **J.L.J.**

Roshchinite*

E.M. Spiridonov, I.V. Petrova, D.M. Dashevskaya, E.P. Balashov, L.M. Klimova (1990) Roshchinite $Ag_{19}Pb_{10}Sb_{51}S_{96}$—A new mineral. Doklady Akad. Nauk SSSR, 312(1), 197–200 (in Russian).

Analysis by electron microprobe (average of 30) gave Ag 14.26(0.28), Cu 0.02(0.16), Pb 15.53(0.55), Zn 0.09(0.04), Fe 0.03(0.01), trace Mn, Hg 0.32(0.14), Sb 44.42(0.79), As 1.42(0.73), S 23.15(0.19), sum 100.04 wt%, corresponding to $(Ag_{17.50}Cu_{1.71})_{\Sigma 19.21}(Pb_{9.93}Zn_{0.19}Fe_{0.05}Hg_{0.16})_{\Sigma 10.33}(Sb_{48.30}As_{2.52})_{\Sigma 50.82}S_{95.59}$, ideally $Ag_{19}Pb_{10}Sb_{51}S_{96}$. X-ray study showed the mineral to be orthorhombic, probable space group *Pmna*, a = 12.946(19), b = 19.048(10), c = 16.932(12) Å, Z = 1. The strongest lines (16 given) are 3.24(60,400), 2.85(80,260,241), 2.70(60,331), 1.866(50,381,471), and 1.765(100,342). The mineral occurs as short, prismatic, partly rounded crystals measuring 0.5 to 4 mm, intergrown with calcite, tetrahedrite, and native gold in the Kvartsitov Gorki gold deposit of northern Kazakhstan. Fluid-inclusion microthermometric data suggest hydrothermal conditions of formation near 200 °C and 50 MPa (0.5 kbar). Other associated minerals are zinkenite, stibnite, chalcostibite, berthierite, jamesonite, tennantite, and andorite. The mineral exhibits the forms {100}, {210}, {110}, {230}, {010}, {111}, {221}, {252}, {201}, {031}, {041}, and {001}; striations occur on some prism faces. The mineral is silver-gray to lead-gray, with metallic luster, steel-gray streak, and is very brittle. VHN_{10-20} = 95 (53–143, n = 11). D_{meas} = 5.265(15), D_{calc} = 5.263 g/cm³. In reflected light, silver-white with a weak blue tint. Bireflectance is weak and noted only on prismatic sections. Anisotropic, but nearly isotropic in cross section. Reflectance values in air (nm, R_{min}%, R_{max}%) are 400 36.9, 40.3; 440 37.0, 40.5; 480 36.6, 40.3; 520 36.3, 40.2; 560 35.7, 39.7; 600 35.0, 38.9; 640 34.4, 38.0; 680 33.6, 37.0; 700 33.0, 36.3.

The name is for Yu. V. Roshchin, a noted geologist from central Kazakhstan. Type material is at the Fersman Mineralogical Museum, Moscow, and at the Mining Museum, Leningrad. **D.A.V.**

Ca acetate

V. Zaćek (1991) Natural occurrence of orthorhombic calcium acetate monohydrate (Kladno, central Bohemia, Czechoslovakia). Casopis mineral. geol., 36, 77–82.

Two chemical analyses gave CaO 26.86, 28.16; H_2O 6.10, 8.30; insol. 1.52, 2.33; CO_2 calc. from TGA 24.81; H_2O calc. from TGA 10.44; the ideal formula $(CH_3COO)_2Ca \cdot H_2O$ requires CaO 31.82, H_2O 10.23, C_2H_6CO 32.96, CO_2 25.0, sum 100 wt%. The X-ray powder pattern (diffractometer, Co radiation) has strongest lines of 9.76(100,110), 3.772(13,301), 3.275(10,014), 3.233(12,104), 2.901 (6,313,204), and 2.423(14,035) Å (50 lines listed, of which three weak ones are not indexable); the results give an orthorhombic cell, a = 11.850(5), b = 17.850(7), c = 13.360(5), in good agreement with the powder data and cell dimensions for synthetic calcium acetate monohydrate (PDF 19–200). Forms white to yellowish, finely fibrous crusts (1–3 cm) on chips of marl. Optically transparent, parallel extinction, α' = 1.480(1), γ' = 1.470(2). Soluble in H_2O, slightly vinegary odor, D_{calc} = 1.687 g/cm³. The infrared spectrum shows a strong, broad absorption band at 3395 cm^{-1} and additional principal bands at 1565, 1455, 1420, 1030, and 680 cm^{-1}.

The acetate forms within burning coal dumps at depths of 15–25 cm beneath the surface at 68–80 °C; associated minerals are sulfur, sal ammoniac, letovicite, alunogen, millosevichite, and boussingaultite. The origin is attributed to reaction of $CaCO_3$ with "wood vinegar" (7–10% acetic acid) distilled from timbers in the dump material. The acetate previously was reported to occur in burning coal dumps in Pennsylvania (R. B. Finkelman and M. E. Mrose, *Newsletter, Friends of Mineralogy,* Pennsylvania Chapter, 8, 3, 3, 1980). **J.L.J.**

$Na_3Ca(Mn,Ca)(CO_3)F$

N.A. Yamnova, D.Yu. Pushcharovskii, A.P. Khomyakov, S.V. Vyatkin (1991) Crystal structure of the new natural fluorocarbonate $Na_3Ca(Mn,Ca)CO_3F$. Kristallografiya, 36, 30–33 (in Russian; English translation in Soviet Phys. Crystallogr., 36(1), 14–16, 1991).

Electron-microprobe analysis (not given) corresponds to $Na_{6.085}(Ca_{2.722}Mn_{0.877}Fe_{0.120}Y_{0.068}Dy_{0.04}Yb_{0.003}Er_{0.002}Gd_{0.001})_{\Sigma 3.833}C_{6.04}O_{18.026}F_{1.974}$. Optically biaxial negative, α = 1.473(2), β = 1.564(2), γ = 1.570(2), $2V$ = 27(1)°, H = 4, D_{meas} = 2.73(2), D_{calc} = 2.71 g/cm³ with Z = 4. X-ray structural study (R = 0.037) indicated monoclinic symmetry, space group *Cc*, a = 8.012(4), b = 15.79(1), c = 7.019(8) Å, β = 100.78(7)°. The mineral occurs as inclusions in nahcolite and trona at the Lovozero alkaline massif, USSR. **J.L.J.**

Ca-phosphoromolybdate

E.I. Kotov, G.M. Skenderov, M.T. Dmitrieva, A.I. Vishnev, A.I. Gorshkov, V.S. Malov (1990) Natural calcium phosphoromolybdate. Doklady Akad. Nauk SSSR, 312(6), 1437–1440 (in Russian).

Analysis of the mineral by electron microprobe (average of five) gave MoO_3 85.03(1.5), P_2O_5 8.33(0.7), CaO 5.50(1.0), sum 98.86 wt%, yielding cations in the ratio $Ca_{1.5}P_{1.8}Mo_{9.0}$. The proposed ideal formula is $[Ca_2O_2(OH)_3]_xPMo_9O_{28}(OH)_3 \cdot (PO)_x$. The mineral dissolves readily in H_2O, concentrated HCl, and dilute alkaline solutions; dissolves slowly in concentrated KOH and NaOH but does not dissolve in concentrated HNO_3. Prolonged exposure to air results in discoloration and alteration to earthy material. X-ray study showed the mineral to be rhombohedral, space group $R3m$, $R\bar{3}m$, $R\bar{3}$, $R3$, or $R32$, a = 10.11 Å, α = 109.5°. An alternative hexagonal unit cell has a = b = 16.51, c = 10.11 Å, Z = 3. The strongest lines (22 given) are 8.24(80,110), 3.36(100,003), 1.653(70,550), 1.482(90,553), and 1.439(70,093). The X-ray pattern is identical to that of ammonia phosphoromolybdate, $(NH_4)_3P(Mo_3O_{10})_4 \cdot 3H_2O$. The mineral forms powdery coatings and drusy aggregates in cavities and fractures of altered fluorapatite veins in a semi-arid region of southeastern Bulgaria, associated with kaolinite and iron oxyhydroxide pseudomorphs of pyrite. Grains are wedge shaped and pseudohexagonal, averaging 0.2 mm in diameter. The mineral is yellow-green, white streak, vitreous luster, subconchoidal fracture, imperfect cleavage, $H = 2–3$, $D_{meas} = 2.94(5)$, $D_{calc} = 3.26$ g/cm^3 (the difference is attributed to the porosity and fractured state of the mineral). In transmitted light, transparent to colorless with weak yellow tint. Gray in reflected light, with yellow internal reflections. Optically anisotropic, negative elongation, oblique extinction, uniaxial negative, $\omega = 1.770(9)$, $\epsilon = 1.729(9)$. **D.A.V.**

Ba-Mn titanosilicate

R.K. Rastsvetaeva, R.A. Tamazyan, E.V. Sokolova, D.I. Belakovskii (1991) Crystal structures of two modifications of natural Ba, Mn-titanosilicate. Soviet Phys. Crystallogr., 36(2), 186–189.

A mineral of composition $BaMn_2TiO[Si_2O_7](OH)_2$ from Inyl'chek ridge, Kirgiziya, USSR, was described recently as structurally similar to bafertisite [*Am. Mineral.*, 76, 1439–1440, 1991]. X-ray structural study of the same specimen showed that the originally described mineral is twinned and consists of two monoclinic components, one with $a = 5.361$, $b = 6.906$, $c = 12.556$ Å, $\beta = 119.8°$, space group $P2_1/m$, composition $Ba\{Mn^{2+}_2(OH)\}\{TiO(OH)[Si_2O_7]\}$, $R = 0.068$. The other has $a = 10.723$, $b = 13.812$, $c = 12.563$ Å, $\beta = 119.9°$, space group Cm, composition as for the preceding phase, $R = 0.083$, isostructural with bafertisite. **J.L.J.**

Mn member of epidote group

E.V. Sokolova, T.N. Nadezhina, L.A. Pautov (1991) Crystal structure of a new natural silicate of manganese from the epidote group. Soviet Phys. Crystallogr., 36(2), 172–174.

Electron-microprobe analysis gave SiO_2 33.0, MgO 2.5, Al_2O_3 11.0, CaO 5.6, TiO_2 1.75, FeO 3.0, MnO 14.5, La_2O_3 8.7, Ce_2O_3 11.0, Nd_2O_3 2.5, Sm_2O_3 0.25, Dy_2O_3 1.25, Pr_2O_3 0.75, V_2O_3 1.1, Cr_2O_3 1.7, F 1.3 wt%; on the basis of X-ray structural study ($R_w = 0.036$), the analysis leads to $(Ca_{0.6}La_{0.2}\square_{0.2})_{\Sigma 1.00}(Ce_{0.5}La_{0.12}Nd_{0.15}Dy_{0.10}Pr_{0.05}Sm_{0.02}\square_{0.07})_{\Sigma 1.01}(Mg_{0.40}Fe_{0.15}Cr_{0.12}Ti_{0.12}V_{0.09}Al_{0.12})_{\Sigma 1.00}MnAl[SiO_4][Si_2O_7](OH)(F_{0.63}O_{0.37})$. The mineral occurs as brown, transparent, prismatic crystals up to 0.3 mm long. Optically biaxial negative, $2V = 83°$, pleochroic from dark brown to pale yellow. X-ray study indicated monoclinic symmetry, space group $P2_1/m$, $a = 8.903(6)$, $b = 5.748(3)$, $c = 10.107(7)$ Å, $\beta = 113.41(5)°$, $Z = 2$. The structure is similar to that of dollaseite-(Ce), $CaCeMg_2AlSi_3O_{11}(F,OH)_2$, but with some differences and with Mn predominant in M3. Occurs in the exocontact of the subalkaline granites of the Inyl'chek massif, Tyan'-Shan, Kirgiziya, USSR. **J.L.J.**

Monoclinic tobermorite

C. Henmi, I. Kusachi (1989) Monoclinic tobermorite from Fuka, Bitchu-cho, Okayama Prefecture, Japan. Ganseki Kobutsu Koshogaku Zasshi, 84, 374–379 (Journal of the Japanese Assoc. Mineralogists, Petrologists, Econ. Geologists; in Japanese, English abstract).

Electron-microprobe and wet-chemical analyses gave SiO_2 46.55, TiO_2 0.01, Al_2O_3 0.36, B_2O_3 0.23, Fe_2O_3 0.01, MnO 0.06, MgO 0.11, CaO 39.04, Na_2O 0.02, K_2O 0.10, H_2O 13.75, F 0.18, O ≡ F 0.08, sum 100.34 wt%, corresponding to $(Ca_{5.29}Mg_{0.02}K_{0.02})_{\Sigma 5.33}(Si_{5.90}Al_{0.05}B_{0.05})_{\Sigma 6.00}(O_{16.54}OH_{1.39}F_{0.07})_{\Sigma 18.00} \cdot 5.1H_2O$, ideally $Ca_5Si_6O_{18} \cdot 4H_2O$. Platy {001} to acicular [010], the former up to 3 mm across; colorless to white, transparent, vitreous luster, perfect {001} and poor {100} cleavages, $H_{25} = 251.274$ kg/mm^2 (Mohs 4.5), $D_{meas} = 2.51$, $D_{calc} = 2.70$ g/cm^3. Refractive indices $\alpha = 1.575$, $\beta = 1.580$, $\gamma = 1.585$. No change observed on heating to 150 °C; changes to 9.3 Å tobermorite at 300 °C and to wollastonite at 800 °C. X-ray single-crystal study indicated monoclinic symmetry, space group Cc or $C2/c$, polysynthetically twinned on (001), $a = 11.331(9)$, $b = 7.353(7)$, $c = 22.67(2)$ Å, $\beta = 96.59(7)°$. Strongest lines of the powder pattern are 11.25(100,002), 3.304(51,$20\bar{6}$,023), 3.068(45,$22\bar{1}$), 3.034(60,221), 2.811(41,008,400,$40\bar{2}$), and 2.794(60,223,117). The mineral occurs with apophyllite, calcite, and 11 Å and 14 Å "orthorhombic" tobermorite in veins about 1 cm wide that cut skarn at Fuka, Kawakami Township, Okayama Prefecture, Japan. **J.L.J.**

$K_2TiSi_6O_{15}$

A.A. Kim, V.Yu. Pankov (1989) First find of a potassium-titanium silicate ($K_2TiSi_6O_{15}$) in platinum minerals of the Inagli pluton. Doklady Akad. Nauk SSSR, 309(3), 690–692 (in Russian, English translation available).

The mineral occurs as inclusions, not larger than 0.05 mm, in two osmiridium (now iridium) grains from a placer derived from the Inagli pluton, central Aladan, USSR. Electron-microprobe analyses gave SiO_2 50.82, TiO_2 21.36, Al_2O_3 0.62, MgO 0.75, CaO 0.13, Na_2O 0.69, K_2O 24.43, sum 98.80 wt%, and SiO_2 49.84, TiO_2 21.19, K_2O 27.11, sum 99.14 wt%, calculated as $K_2Ti_{0.74}Si_{3.26}O_9$ or $K_2TiSi_3O_9$. The mineral has regular outlines, similar in cross section to those of diopside, and coexists with phlogopite and pectolite. **J.L.J.**

K-Na-Zn-Mn silicate

T.N. Nadezhina, E.V. Sokolova, D.I. Belakovskii (1990) The crystal structure of $K(K_{0.58}Na_{0.42})_2Zn_3Mn_{1.5}$-

$[Si_{12}O_{30}]$—A new natural representative of the milarite structural type. Doklady Akad. Nauk SSSR, 313(4), 865–868 (in Russian).

Analysis of the mineral (method not reported) gave ZnO 15.24, MnO 10.43, CaO 0.35, SiO_2 62.61, FeO 0.13, Na_2O 3.19, K_2O 8.06, sum 100.01 wt%, corresponding to $K_{2.00}Na_{1.21}Ca_{0.07}Zn_{2.19}Mn_{1.72}Fe_{0.02}Si_{12.20}O_{30}$, based on 30 O atoms. Single-crystal X-ray studies showed the mineral to be hexagonal, space group *P6cc* or *P6/mcc* (probably *P6cc*), $a = 10.525(6)$, $c = 14.218(9)$ Å, $Z = 2$, $D_{calc} = 2.92$ g/cm³. The structure is of the milarite type. The mineral is colorless and transparent; occurs in pegmatitic quartz boulders from glacial moraine, southern Tadzhikistan, in fine-grained aggregates 2 cm wide, associated with reedmergnerite, microcline, and eudialyte.

Discussion. The analysis as reported does not correspond to the chemical formula given in the title. **D.A.V.**

New Data

Acuminite

E. Krogh Andersen, G. Ploug-Sørensen, E. Leonardsen (1991) The structure of acuminite, a strontium aluminum fluoride mineral. Zeits. Kristallogr., 194, 221–227.

X-ray crystal-structural study ($R = 0.069$) of holotype acuminite, $SrAlF_4(OH)\cdot H_2O$, specified the space group as *C2/c*. **J.L.J.**

Langbanite

G. Giuseppetti, F. Mazzi, C. Tadini (1991) The crystal structure of monoclinic langbanite: $(Mn,Ca,Fe,Mg)_4^{2+}$-$(Mn,Fe)_9^{3+}Sb^{5+}[O_{16}(SiO_4)_2]$. Neues Jahrb. Mineral. Mon., 193–211.

X-ray structural study ($R = 0.027$) of langbanite from Langban, Sweden, indicated monoclinic symmetry, space group *C2/m*, $a = 11.561(5)$, $b = 20.05(1)$, $c = 11.075(9)$ Å, $\beta = 90.03(5)°$, calculated chemical formula $(Mn_{3.62}Ca_{0.27}Fe_{0.07}Mg_{0.04})^{2+}_{\Sigma 4.00}(Mn_{7.04}Fe_{1.96})^{3+}_{\Sigma 9.00}Sb^{5+}[O_{16}(SiO_4)_2]$, $Z = 6$. A subcell one-sixth that of the monoclinic cell shows pseudotrigonal symmetry, and most grains simulate trigonal symmetry by triple twinning. It is speculated that, whereas Fe-rich langbanite is monoclinic, Fe-poor langbanite may have the trigonal cell previously reported for this mineral. **J.L.J.**

Perryite

A. Okada, K. Kobayashi, T. Ito, T. Sakurai (1991) Structure of synthetic perryite, $(Ni,Fe)_8(Si,P)_3$. Acta Crystallogr., C47, 1358–1361.

Electron-microprobe analysis of synthetic perryite, prepared by melting of the elements, gave Ni 82.5, Fe 2.4, Si 12.2, P 3.7 wt% [sum 100.8], corresponding to $(Ni_{0.97}Fe_{0.03})_8(Si_{0.79}P_{0.21})_3$, similar to that of perryite in the Norton County enstatite achondrite. X-ray structural study ($R = 0.027$) gave trigonal symmetry, space group *R3c*, hexagonal axes $a = 6.640(2)$, $c = 37.982(7)$ Å, $D_{calc} = 7.63(1)$ g/cm³ with $Z = 12$. Twinned on {0001}. The formula and cell are new. **J.L.J.**

Roggianite

G. Giuseppetti, F. Mazzi, C. Tadini, E. Galli (1991) The revised crystal structure of roggianite: $Ca_2[Be(OH)_2$-$Al_2Si_4O_{13}] < 2.5H_2O$. Neues Jahrb. Mineral. Mon., 307–314.

X-ray crystal-structural study ($R = 0.061$) of roggianite gave tetragonal symmetry, space group *I4/mcm*, $a = 18.33$, $c = 9.16$ Å, composition $Ca_2[Be(OH)_2Al_2Si_4O_{13}]\cdot < 2.5H_2O$, $Z = 8$. The formula is new. **J.L.J.**

Terskite

Z.V. Pudovkina, N.M. Chernitsova (1991) Crystal structure of terskite $Na_4Zr[H_4Si_6O_{18}]$. Doklady Akad. Nauk SSSR, 316(3), 645–649 (in Russian).

X-ray crystal-structural study of terskite gave $a = 14.195(8)$, $b = 14.750(5)$, $c = 7.511(2)$ Å, space group *Pnc2*, $Z = 4$. The space group is new. **J.L.J.**