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NEW MINERAL NAMES*

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Andyrobertsite*, calcioandyrobertsite*

M.A. Cooper, F.C. Hawthorne, W.W. Pinch, J.D. Grice (1999) Andyrobertsite and calcioandyrobertsite: two new minerals from the Tsumeb mine, Tsumeb, Namibia. Mineral. Record, 30, 181–186.

The minerals form a lamellar intergrowth that is crystallographically continuous. Electron microprobe analyses for andyrobertsite and calcioandyrobertsite gave, respectively, K_2O 4.00, 4.05, CaO 1.36, 3.52, MnO 0.64, 0.86, CdO 6.48, 1.26, ZnO 0.19, 0.04, CuO 31.72, 32.86, As_2O_5 47.58, 49.56, H_2O (calc.) 4.44, 4.61, sum 96.41, 96.75 wt%, corresponding to $K_{1.03}(Cd_{0.61}Ca_{0.30}Mn_{0.11})_{\Sigma 1.02}(Cu_{4.85}Zn_{0.03})_{\Sigma 4.88}(AsO_4)_{4.04}[As(OH)_2O_2](H_2O)_2$ and $K_{1.01}(Ca_{0.74}Mn_{0.14}Cd_{0.12})_{\Sigma 1.00}(Cu_{4.85}Zn_{0.01})_{\Sigma 4.86}(AsO_4)_{4.06}[As(OH)_2O_2](H_2O)_2$, ideally$KCdCu_5(AsO_4)_4[As(OH)_2O_2](H_2O)_2$ and $KCaCu_5(AsO_4)_4[As(OH)_2O_2](H_2O)_2$. The minerals occur as plates, up to 0.1 × 5 × 10 mm, that radiate from the center of an aggregate 1.4 cm long and 1 cm at the base. Crystals have {100} dominant, with {210}, {001}, $\{10\bar{2}\}$, and {011}. Electric blue color, vitreous luster, pale blue streak, brittle, conchoidal fracture, good cleavage parallel to (100), $H = 3$, nonfluorescent, no twinning observed, $D_{calc} = 4.011$ g/cm^3 for $Z = 2$ and formula Cd:Ca = 0.5:0.5. Greenish blue and nonpleochroic in transmitted light, biaxial negative, $X \wedge a = 12°$ (in β obtuse), $Y = b$, $Z = c$. For andyrobertsite and calcioandyrobertsite, respectively, $\alpha = 1.720(3)$, 1.713(3), $\beta = 1.749(1)$, 1.743(1), $\gamma = 1.757(1)$, 1.749(1), $2V_{meas} = 50(5)$, 50(5)°, $2V_{calc} = 55$, 48°. Single-crystal X-ray structure study indicated monoclinic symmetry, space group $P2_1/m$; $a = 9.810(4)$, $b = 10.034(3)$, $c = 9.975(4)$ Å, $\beta = 101.84(4)°$ as refined from a 114 mm Debye–Scherrer pattern ($CuK\alpha$ radiation) with strongest lines of 9.64(100,100), 4.46(40,120), 3.145(50,130,122), 3.048(40,$\bar{2}$22), and 2.698(40,320).

The minerals are perched on a base of adamite and olivenite in a specimen from the Tsumeb mine, Namibia. The new names are for Andrew C. Roberts (b. 1950), mineralogist at the Geological Survey of Canada, Ottawa. Type material is in the Royal Ontario Museum, Toronto, and in the Smithsonian Institution, Washington. **J.L.J.**

Bleasdaleite*

W.D. Birch, A. Pring, U. Kolitsch (1999) Bleasdaleite, $(Ca,Fe^{3+})_2Cu_5(Bi,Cu)(PO_4)_4(H_2O,OH,Cl)_{13}$, a new mineral from Lake Boga, Victoria, Australia. Austral. J. Mineral., 5, 69–75.

The mineral occurs as tabular crystals, up to 20 μm across and <1 μm thick, that form dark brown scaly crusts and hemispheres up to 100 μm across. Electron microprobe analysis gave CaO 7.59, CuO 34.79, Bi_2O_3 15.53, Fe_2O_3 3.04, Al_2O_3 0.13, P_2O_5 21.70, As_2O_5 0.34, Cl 1.01, H_2O (by difference) 16.10, O ≡ Cl 0.23, sum 100 wt%, corresponding to $(Ca_{1.63}Fe^{3+}_{0.46})_{\Sigma 2.09}Cu_5(Bi_{0.80}Cu_{0.25})_{\Sigma 1.05}[(PO_4)_{3.67}(AsO_4)_{0.04}]_{\Sigma 3.71}[Cl_{0.34}(OH)_{6.15}]\cdot 7.7H_2O$. Resinous luster, pale brown streak, $H = 2$, transparent, well-developed {001} cleavage, $D_{calc} = 2.77$ g/cm^3 for $Z = 4$. Optically biaxial negative, $\alpha = 1.718(4)$, $\beta = 1.748(3)$, $\gamma = 1.748(3)$, $2V_{calc} \approx 0°$, $X = c$, $Y/Z = a/b$, medium strong pleochroism, X = pale yellow-brown, $Y = Z$ = dark yellow-brown, $X < Y = Z$. Electron diffraction patterns and the similarity to the cell of richelsdorfite indicated monoclinic, pseudotetragonal symmetry, probable space group $C2/m$; $a = 14.200(7)$, $b = 13.832(7)$, $c = 14.971(10)$ Å, $\beta = 102.08(8)°$ as refined from a 100 mm Guinier–Hägg pattern ($CrK\alpha$ radiation). Strongest lines (intensities from a 114 mm Gandolfi pattern, Co radiation) are 14.57(100,001), 6.95(40,200), 6.28(40,$\bar{1}$12,021), 3.469(30b,312,400), 2.816(40,043), 2.507(30,152,243), and 2.452(30,440).

The mineral occurs in cavities in a pegmatite containing supergene chalcocite partly oxidized to a suite that includes malachite, pseudomalachite, chalcosiderite-turquoise, ulrichite, torbernite, libethenite, and iodargyrite. The new mineral name is for Reverend John I. Bleasdale (1822–1884) in recognition of his promotion of mineralogy in Victoria. Type material is in the Museum of Victoria, Melbourne, and in the South Australian Museum, Adelaide, Australia. **J.L.J.**

Formicaite*

N.V. Chukanov, S.V. Malinko, A.E. Lisitsyn, V.T. Dubinchuk, O.V. Kuz'mina, A.E. Zadov (1999) Formicaite $Ca(HCO_2)_2$, a new mineral. Zapiski Vseross. Mineral. Obshch., 128(2), 43–47 (in Russian).

Electron microprobe analysis gave Ca 29.80, Na 0.13, Mn 0.23, K 0.10, and gas chromatography of combustion products

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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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gave H 1.90, C 20.28, O (calc. for the ideal formula) 49.19, sum 101.63 wt%, corresponding to $(Ca_{0.88}Na_{0.01}H_{0.23})(HCO_2)_2$. Occurs as compact cryptocrystalline and colloform masses, and as aggregates in which the crystals are tabular and up to 5 × 30 × 30 μm. White color with a bluish tint, white streak, $H = 1$ for compact aggregates, perfect {100} cleavage, $D_{meas} = 1.9(1)$, $D_{calc} = 1.99$ g/cm^3 for $Z = 4$. Some specimens show a weak, light bluish luminescence in shortwave ultraviolet light. The infrared spectrum has absorption bands at 791, 1364, 1380, and 1603 (very strong), 2870 (weak), and 2925 cm^{-1} (very weak). Optically uniaxial postive, $\omega = 1.553(2)$, $\varepsilon = 1.573(2)$. Electron diffraction patterns gave $a = 6.79(4)$, $c = 9.50$ Å. The X-ray powder pattern (diffractometer, Fe$K\alpha$ radiation, 20 lines given) is almost identical to that of synthetic Ca β-formiate, which is tetragonal, space group $P4_12_12_1$; strongest lines are 5.54(90,011), 3.40(100,200), 3.19(60,021), 2.859(80,013), 2.196(70,031), and 1.947(60,132); $a = 6.770(10)$, $c = 9.50(4)$.

The mineral occurs in hydrothermal veinlets that cut kurchatovite-sakhaite ore at the Solongo skarn deposit, Buryatia Republic, Russian Federation. Associated minerals are calcite, lizardite, frolovite, pentahydroborite, hexahydroborite, and vimsite. Also occurs in a veinlet within skarnified marble containing calcite, vesuvianite, pentahydroborite, frolovite, calciborite, and uralborite at the Novofrolovskoye Cu deposit, Urals, Russia. The new mineral name alludes to the composition. Type material is in the Fersman Mineralogical Museum, Moscow, Russia. **N.N.P.**

Khaidarkanite*

N.V. Chukanov, V.Yu. Karpenko, R.K. Rastsvetaeva, A.E. Zadov, O.V. Kuz'mina (1999) Khaidarkanite $Cu_4Al_3(OH)_{14}F_3{\cdot}2H_2O$, a new mineral from the Khaidarkan deposit, Kyrgyzstan. Zapiski Vseross. Mineral. Obshch., 128(3), 58–63 (in Russian).

Electron microprobe analyses gave an average and range of Na_2O 1.58 (1.20–1.96), CuO 46.09 (46.27–45.91), Al_2O_3 22.35 (21.36–23.34), SiO_2 0.78 (0.47–1.10), SO_3 2.32 (0.10–4.55), sum 100.17 (98.43–101.93) wt%; wet-chemical analyses gave SiO_2 0.50, SO_3 4.7, H_2O 22.30, F 8.05, O ≡ F 3.30 wt%. The empirical formula is $Na_{0.35}Cu_4Al_{2.96}(OH)_{13.71}F_{2.92}(SO_4)_{0.29}(SiO_4)_{0.09}{\cdot}1.47H_2O$, ideally $Cu_4Al_3(OH)_{14}F_3{\cdot}2H_2O$. Whether Na, Si, and S are physical impurities or are interlayered is uncertain. The mineral occurs as flat, acicular crystals up to 0.03 × 0.05 × 7 mm, as radial aggregates up to 1 mm across, and as fibrous aggregates. Light blue or bright sky-blue color, vitreous luster, light blue streak, $H = {\sim}2\frac{1}{2}$, $D_{meas} = 2.84$, $D_{calc} = 3.00$ g/cm^3 for $Z = 1$. Optically biaxial positive, $\alpha = 1.585(2)$, $\beta = 1.615(3)$, $\gamma = 1.648(2)$, $2V_{calc} = 80$–90°, positive elongation with extinction angle 5°; X = colorless, Y = sky blue, Z = bright blue, $Z > Y > X$. The infrared spectrum has absorption bands at 3490, 3400, 3190, 1630, 1560, 1135, 1101, 1036, 930, 885, 744, 658, 574, 508, and 452 cm^{-1}. Single-crystal X-ray structure study ($R = 0.029$) gave monoclinic symmetry, space group $C2/m$, $a = 12.346(3)$, $b = 2.907(3)$, $c = 10.369(7)$ Å, $\beta = 97.90(2)$°. Strongest lines of the powder pattern (diffractometer, Fe$K\alpha$ radiation, 36 lines given) are 10.29(80,001), 5.589 (90,$20\bar{1}$), 4.232(100,$20\bar{2}$), 2.828(90,203), 2.362(100,310), 1.871(80,114,$51\bar{1}$), and 1.817(80,$51\bar{2}$). The crystal structure contains columns of Al octahedra coupled by Cu polyhedra into layers. The F atoms occupy separate positions.

The mineral is associated with calcite, quartz, barite, fluorite, malachite, Cu allophane, conichalcite, chrysocolla, and an Al fluorhydroxide in the oxidation zone of the Khaidarkan Sb-Hg deposit, Kyrgyzstan. The new name is for the locality. Some of the properties of the mineral, such as the refractive indices, cell parameters, and infrared spectrum, are similar to those of cyanotrichite. Type material is in the Fersman Mineralogical Museum, Moscow, and in the S.V. Tsaregorodtsev collection at the Ilmenskii Reservation, South Urals, Russia. **N.N.P.**

Korobitsynite*

I.V. Pekov, N.V. Chukanov, A.P. Khomyakov, R.K. Rastsvetaeva, Ya.V. Kucherinenko, V.V. Nedel'ko (1999) Korobitsynite $Na_{3-x}(Ti,Nb)_2[Si_4O_{12}](OH,O)_2{\cdot}3$–$4H_2O$ — a new mineral from the Lovozero massif, Kola Peninsula. Zapiski Vseross. Mineral. Obshch., 128(3), 72–79 (in Russian).

Electron microprobe analysis of more than 50 crystals gave an average of Na_2O 13.87, K_2O 0.03, BaO 0.54, ZrO_2 0.04, TiO_2 21.38, SiO_2 40.91, Nb_2O_5 10.14, H_2O 12.20 (TGA, one sample), sum 99.11 wt%, corresponding to $Na_{2.62}Ba_{0.02}(Ti_{1.57}Nb_{0.45})_{\Sigma 2.02}[Si_4O_{12}](OH_{1.13}O_{1.03})_{\Sigma 2.16}{\cdot}3.4H_2O$. The mineral occurs as colorless prismatic grains and needle-like crystals up to 2 cm long, showing {110}, {001}, {010}, {100}, and {021}. Transparent, vitreous luster, brittle, H = about 5, VHN_{25} = 620(50), uneven fracture, imperfect {001} cleavage, $D_{meas} = 2.72$, $D_{calc} = 2.68$ g/cm^3 for $Z = 2$. Optically biaxial positive, $\alpha = 1.646$–$1.650(2)$, β 1.654–1.658(2), $\gamma = 1.763$–$1.780(5)$, $2V_{meas} = 30°$, $X = b$, $Y = c$, $Z = a$. The infrared spectrum has absorption bands at 3500, 3390, 3250, 1633, 1118, 959, 919, 750, 667, and 454 cm^{-1}. Single-crystal X-ray structure study ($R = 0.048$) gave orthorhombic symmetry, space group $Pbam$, $a = 7.349(2)$, $b = 14.164(2)$, $c = 7.130(1)$ Å. Strongest lines of the powder pattern (diffractometer, Cu$K\alpha$ radiation, 29 lines given) are 7.09(79,001,020), 6.53(85,110), 3.262(100,201,220), 3.180 (52,022,211,041), 2.553(56,202,240), and 2.075(57,242).

The mineral, which is the Ti-dominant analog of the isostructural mineral nenadkevichite, was found in specimens from mines in the Alluaiv and Karnasurt mountains, Kola Peninsula, Russia. At Alluaiv Mountain, korobitsynite and nenadkevichite are megascopically indistinguishable and occur in three parageneses in miarolitic cavities of a giant pegmatite: with albite, aegirine, shortite, rhodochrosite, epididymite, leifite, tainiolite, pyrrhotite, thermonatrite, nahpoite, and amorphous bitumen; with albite, aegirine, elpidite, lorenzenite, sphalerite, galena, shomiokite-(Y), trona, natron, and natroxalate; with elpidite, quartz, aegirine, sidorenkite, epididymite, sphalerite, löllingite, pyrrhotite, and belovite-(Ce). At Kasnasurt Mountain, the mineral occurs within nests of a cryptocrystalline Na-Fe hydrosilicate with natrolite, apophyllite, fluorite, sphalerite, galena, and molybdenite. Epitaxial intergrowth with elpidite, and irregular intergrowths with labuntsovite are common. The new mineral name is for amateur mineralogist Mikhail Fyodorovich Korobitsyn (1928–

1996), who made significant contributions to knowledge of the mineralogy of the Lovozero massif. Holotype material is in the Fersman Mineralogical Museum, Moscow, Russia.

Discussion. Corresponds to the then-unnamed mineral abstracted in *Am. Mineral*., 84, p.195 (1999). **N.N.P.**

Oneillite*

O. Johnsen, J.D. Grice, R.A. Gault (1999) Oneillite: a new Ca-deficient and *REE*-rich member of the eudialyte group from Mont Saint-Hilaire, Quebec, Canada. Can. Mineral., 37, 1295–1301.

The mineral occurs as yellowish brown, anhedral grains up to 2 mm in diameter. Electron microprobe analysis gave Na_2O 13.60, K_2O 0.28, CaO 2.90, MnO 7.70, FeO 3.00, SrO 0.09, Al_2O_3 0.18, Y_2O_3 0.78, La_2O_3 2.88, Ce_2O_3 5.14, Pr_2O_3 0.48, Nd_2O_3 1.45, Gd_2O_3 0.20, SiO_2 43.46, ZrO_2 11.44, HfO_2 0.16, Nb_2O_5 3.48, Ta_2O_5 0.14, Cl 0.76, H_2O (calc.) 0.63, O ≡ Cl 0.17, sum 98.58 wt%, which for 78.09 anions as determined from the crystal-structure determination, corresponds to $(Na_{14.37}REE_{1.53}K_{0.20}Sr_{0.03})_{\Sigma 16.13}(Ca_{1.77}REE_{0.59}Na_{0.66})_{\Sigma 3.02}(Mn_{2.76}Y_{0.24})_{\Sigma 3.00}(Fe_{1.43}Mn_{0.96}Zr_{0.25})_{\Sigma 2.64}(Zr_{2.93}Nb_{0.05}Hf_{0.03})_{\Sigma 3.01}(Nb_{0.85}Ta_{0.02})_{\Sigma 0.87}(Si_{24.77}Al_{0.12})_{\Sigma 24.89}O_{73}(O,OH,H_2O)_{3.09}(OH_{1.27}Cl_{0.73})_{\Sigma 2.00}$, ideally $Na_{15}Ca_3Mn_3Fe_3Zr_3Nb(Si_{25}O_{73})(O,OH,H_2O)_3(OH,Cl)_2$. Transparent to translucent, vitreous luster, brittle, white streak, H = 5–6, no cleavage, no parting, uneven fracture, nonfluorescent, D_{meas} = 3.20(3), D_{calc} = 3.22 g/cm³ for Z = 3. Optically uniaxial negative, ω = 1.6450(3), ε = 1.6406(3), nonpleochroic, some grains anomalously biaxial with 2V up to 15°. Single-crystal X-ray structure study (R = 0.032) indicated trigonal symmetry, space group $R3$; a = 14.192(1), c = 29.983(3) Å as refined from a diffractometer pattern (Cu$K\alpha$ radiation) with strongest lines of 11.348(44,101), 6.021(36,021), 4.291(37,205), 3.389(43,131), 2.964(100,315), and 2.844(89,404).

The mineral is a member of the eudialyte group and is distinguished by Mn dominance in the M1 site; ordering of Mn and Ca + REE at M1 lowers the symmetry from $R3m$ to $R3$. The mineral is associated with albite, sodalite, pyrite, and aegirine along the contact between a vein of albite and its host nepheline syenite at the Poudrette quarry, Mont Saint-Hilaire. The new name is for John J. O'Neill (1886–1966) of McGill University, who was the first to describe the geology of Mont Saint-Hilaire. Type material is in the Canadian Museum of Nature, Ottawa. **J.L.J.**

Scainiite*

P. Orlandi, Y. Moëlo, A. Meerschaut (1999) Lead-antimony sulfosalts from Tuscany (Italy). I. Scainiite, $Pb_{14}Sb_{30}S_{54}O_5$, the first Pb-Sb oxy-sulfosalt, from Buca della Vena mine. Eur. J. Mineral., 11, 949–954.

The mineral occurs as black, acicular [010] crystals, up to 2 mm long and 0.2 mm thick. Electron microprobe analysis gave Pb 36.99, Sb 41.80, S 20.39, O 0.65, sum 99.83 wt%, corresponding to $Pb_{15.05}Sb_{28.95}S_{53.62}O_{3.43}$, ideally $Pb_{14}Sb_{30}S_{54}O_5$ on the basis of the crystal-structure determination. Opaque, bluish metallic luster, brittle, irregular fracture, VHN_{20} = 192, D_{calc} = 5.56 g/cm³. In reflected light, weakly anisotropic and bireflectant, nonpleochroic, rare reddish internal reflection. Reflectance percentages of a basal section, in air and in oil, are given in 10 nm steps from 400 to 800 nm. Single-crystal X-ray structure study indicated monoclinic symmetry, space group $C2/m$; a = 52.01(3), b = 8.13(1), c = 24.34(2) Å, β = 104.03(7)° as refined from a 114 mm Gandolfi pattern (Cu$K\alpha$ radiation) with strongest lines of 3.472(100,$\overline{14}$.0.4), 3.041(35,$\overline{6}$25,$\overline{4}$08), 2.956(54,$\overline{12}$.2.1,$\overline{12}$.2.2,10.2.2), 2.827(20,$\overline{6}$26,026,$\overline{12}$.2.4), 2.228(22,22.0.1,$\overline{22}$.0.6,$\overline{8}$29), and 2.052(46,8.0.10,14.0.8, 24.0.1).

The mineral is associated with sphalerite, cinnabar, galena, tetrahedrite, and numerous Pb-Sb sulfosalts in late-stage hydrothermal calcite veins that cut Ba-Fe ores and host rocks at the former Buca della Vena mine near Pietrasanta in the southern part of the Apuan Alps, Tuscany, Italy. The new name is for engineer and mineralogist Dr. Giuseppe Scaini (1906–1988). Type material is in the Museo di Storia Naturale e del Territorio at the University of Pisa, and in the Musée de l'Ecole des Mines de Paris, France. **J.L.J.**

Sidpietersite*

A.C. Roberts, M.A. Cooper, F.C. Hawthorne, A.J. Criddle, C.J. Stanley, C.L. Key, J.L. Jambor (1999) Sidpietersite, $Pb^{2+}_4(S^{6+}O_3S^{2-})O_2(OH)_2$, a new thiosulfate-bearing mineral species from Tsumeb, Namibia. Can. Mineral., 37, 1269–1273.

M.A. Cooper, F.C. Hawthorne (1999) The structure topology of sidpietersite, $Pb^{2+}_4(S^{6+}O_3S^{2-})O_2(OH)_2$, a novel thiosulfate structure. Can. Mineral., 37, 1275–1282.

The mineral occurs as earthy to nodular masses and as aggregates of free-standing to radiating bladed crystals up to 3 mm in longest dimension. Electron microprobe analysis, and partitioning on the basis of the crystal-structure determination, gave PbO 89.55, $S^{6+}O_3$ 7.58, S^{2-} 3.035, H_2O (calc.) 1.79, O ≡ S^{2-} 1.51, sum 100.45 wt%, which for O + S^{2+} = 8 corresponds to $Pb^{2+}_{4.09}(S^{6+}_{0.97}O_{2.90}S^{2-}_{0.97})O_{2.09}(OH)_{2.03}$. Crystals are colorless, vitreous luster, up to 0.3 mm in length, elongate [01$\overline{1}$], dominated by {001}, with minor forms possibly {100} and {01$\overline{1}$} Other material varies from beige-cream to off-white in color, earthy to somewhat pearly luster, opaque in masses. Sectile, uneven fracture, cleavage perpendicular to [01$\overline{1}$] H = 1–2, nonfluorescent, no twinning observed, D_{calc} = 6.765 g/cm³ for the ideal formula and Z = 2; effervesces in dilute HCl. The infrared spectrum shows absorption bands characteristic of hydroxyl and thiosulfate. Single-crystal X-ray structure study (R = 0.03) indicated triclinic symmetry, space group $P\overline{1}$; a = 7.447(4), b = 6.502(4), c = 11.206(4) Å, α = 114.30(3), β = 89.51(4), γ = 89.04(6)° as refined from a 114 mm Debye–Scherrer powder pattern (Cu$K\alpha$ radiation) with strongest lines of 10.13(100,001), 5.93(50,010), 4.401(35,011), 3.414(100,003), 3.198(80,02$\overline{2}$), 2.889(35,02$\overline{3}$,211), 2.805(35,$\overline{2}$11,01$\overline{4}$), and 2.622(40,$\overline{2}$1$\overline{3}$).

The mineral occurs on a matrix of galena and sphalerite, containing minor greenockite and quartz, on which are pink to colorless crystals of smithsonite. The new mineral name is for Sidney Pieters (b. 1920) of Windhoek, Nambia, in recognition of his contributions to Namibian mineralogy. Type material is in the Systematic Reference Series of the National Mineral Collection at the Geological Survey of Canada, Ottawa, and in The National History Museum, London, Great Britain. **J.L.J.**

Springcreekite*

U. Kolitsch, M.R. Taylor, G.D. Fallon, A. Pring (1999) Springcreekite, $BaV^{3+}_3(PO_4)_2(OH,H_2O)_6$, a new member of the crandallite group, from the Spring Creek mine, South Australia: the first natural V^{3+}-member of the alunite family and its crystal structure. Neues Jahrb. Mineral. Mon., 529–544.

The mineral occurs as black rhombohedra, up to 0.1 mm in size. Electron microprobe analysis gave BaO 23.43, SrO 0.27, CaO 0.15, Na_2O 0.08, V_2O_3 19.44 (25.50 for a cotype specimen), Fe_2O_3 15.02, Al_2O_3 0.32, CuO 0.17, ZnO 0.14, P_2O_5 23.26, SiO_2 0.20, H_2O (calc.) 12.16, F 0.21, O ≡ F 0.09, sum 94.67 wt%, corresponding to $(Ba_{0.92}Ca_{0.02}Sr_{0.02}Na_{0.02})_{\Sigma 0.98}(V^{3+}_{1.57}Fe^{3+}_{1.14}Al_{0.05}Cu_{0.01}Zn_{0.01})_{\Sigma 2.78}[(P_{0.99}Si_{0.02})O_4]_2(OH_{4.17}F_{0.07}H_2O_{1.76})_{\Sigma 6.00}$. Pitch-black color, almost semi-metallic luster, brownish black streak, brittle, poor cleavage or parting $\{10\overline{1}2\}$ irregular fracture, $H = 4$–5, nonfluorescent, some crystals modified by {0001}, $D_{meas} = 3.48(3)$, $D_{calc} = 3.58$ g/cm³ for the empirical formula and $Z = 3$. Optically uniaxial negative, $\omega = 1.858(5)$, $\varepsilon = 1.817(4)$, strongly pleochroic, E = pale brownish to brownish, O = blackish brown to black. Single-crystal X-ray structure study ($R = 0.029$) gave trigonal symmetry, space group $R\overline{3}m$; $a = 7.258(1)$, $c = 17.361(9)$ Å as refined from a 114 mm Gandolfi pattern (Co$K\alpha$ radiation) with strongest lines of 5.90(90,101), 3.627(40,110), 3.073(100,113), 2.301(40,107, 122), 1.971(50,033), and 1.814(40,220).

The mineral is associated with quartz, copper, cuprite, goethite, whitlockite, mitridatite, bariosincosite, and fluorapatite in specimens of dump material from the Spring Creek mine, a small vein deposit mined for Cu until the late 1920s, near Wilmington, southern Flinders Ranges, South Australia. Type material is in the South Australian Museum, Adelaide, Australia. **J.L.J.**

Tietaiyangite

Rubo Zhang, Zhongliang Zhong (1999) $Fe^{3+}_4FeTiO_9$, a Fe-Ti oxide mineral consisting of $2Fe_2O_3$–$FeTiO_3$. Acta Mineral. Sinica, 19(3), 257–261 (in Chinses, English abs.).

Wet-chemical analysis gave Fe_2O_3 62.23, MgO 0.22, MnO 1.24, FeO 13.98, TiO_2 17.96, SiO_2 3.87, CaO 0.20, sum 99.70 wt%, for which $(Fe^{3+}+Mn):(Fe^{2+}+Mg):Ti = 8.20:2.05:2.31$, or 8:2:2. Mössbauer spectroscopy indicated $Fe^{3+}/Fe^{2+} = 3.54$. The mineral occurs as two irregular grains, roughly 1 to 1½ cm across; dark brown color, metallic luster, red streak, no cleavage, $H = 5\frac{1}{2} - 6$, $D_{meas} = 5.30$–5.50 g/cm³. In reflected light, gray-white color, poor reflection pleochroism; reflectance percentages, given in 10 nm steps from 400 to 700 nm, range from 27.37 to 22.65. Strongest lines of the X-ray powder pattern (57 mm camera) are 2.72(100,014), 2.52(100,110), 2.22(60,113), 1.85(80,115), 1.70(90,008), 1.62(90,122), 1.49(80,124), and 1.457(80,027); the calculated cell is hexagonal, $a = 5.04$, $c = 13.55$ Å, possible space group $P6_3$/m, $Z = 2$. The mineral is associated with columbite-tantalite, microlite, zircon, muscovite, and other minerals in a pegmatite mine at Altay Mountain, Xinjiang, western China.

Discussion. The analysis corresponds to $Fe^{3+}_{3.82}Mn_{0.09}Fe^{2+}_{0.95}Mg_{0.03}Ti_{1.10}O_9$. The mineral has not been submitted to the CNMMN for a vote. In the Chinese text the authors refer to the mineral generically, as in the title of the paper; the new name, which is Chinese for iron titanium oxide, appears only in the English abstract. **J.L.J.**

Walfordite*

M.E. Back, J.D. Grice, R.A. Gault, A.J. Criddle, J.A. Mandarino (1999) Walfordite, a new tellurite species from the Wendy open pit, El Indio–Tambo mining property, Chile. Can. Mineral., 37, 1261–1268.

The mineral occurs as orange, equant crystals, up to 0.2 mm across. Electron microprobe analysis, and data from the crystal-structure determination, gave MgO 0.38, Fe_2O_3 8.30, TiO_2 1.11, TeO_2 81.74, TeO_3 8.67, sum 100.20 wt%, corresponding to $(Fe^{3+}_{0.61}Te^{6+}_{0.29}Ti_{0.08}Mg_{0.06})_{\Sigma 1.04}Te^{4+}_3O_8$, ideally $(Fe^{3+},Te^{6+})Te^{4+}_3O_8$, which is the Fe^{3+}-dominant analog of winstanleyite. Most crystals are simple cubes, some are modified by {111}. Opaque, adamantine luster, yellow-orange streak, brittle, no cleavage or parting, H not determinable, nonfluorescent, $D_{calc} = 5.84$ g/cm³ for $Z = 8$. Optically isotropic, $n_{calc} = 2.23$, pale gray in reflected light, with colorless to lemon-yellow internal reflections. Single-crystal X-ray structure study ($R = 0.0349$) indicated cubic symmetry, space group $I2_1/a\overline{3}$, $a = 11.011(5)$ Å. The X-ray powder pattern (114 mm Gandolfi, Cu$K\alpha$ radiation) has strongest lines of 4.486(29,211), 3.175(100,222), 2.749(37,400), 1.944(44,440), and 1.658 (45,622).

The mineral is associated with alunite, rodalquilarite, gold, emmonsite, jarosite, and pyrite in the interstices of silicified hydrothermal breccias at the Tambo mine (approx. 30° W longitude and 30° S latitude) in Chile. The new mineral name is for geologist Phillip Walford (b. 1945) of Toronto, Canada, who collected the original specimens. Type material is in the Royal Ontario Museum, Toronto. **J.L.J.**

Xenotime-(Yb)*

H.M. Buck, M.A. Cooper, P. Černý, J.D. Grice, F.C. Hawthorne (1999) Xenotime-(Yb), $YbPO_4$, a new mineral species from the Shatford Lake pegmatite group, southeastern Manitoba, Canada. Can. Mineral., 37, 1303–1306.

One of two listed electron microprobe analyses gave Lu 9.84, Yb 32.27, Tm 2.52, Er 7.69, Ho 0.61, Dy 3.57, Gd 0.23, Y 12.51, P 29.03, sum 98.27 wt%, corresponding to $(Yb_{0.40}Y_{0.27}Lu_{0.12}Er_{0.12}Dy_{0.05}Tm_{0.04}Ho_{0.01})_{\Sigma 1.01}P_{1.01}O_4$. The mineral occurs as aggregates and single crystals, each to ~50 µm, in muscovite. Colorless to pale yellowish or brownish, transparent, vitreous luster, white streak, brittle, uneven fracture, no cleavage or parting, *H* not determinable, nonfluorescent, D_{calc} = 5.85 g/cm^3 for $Z = 4$. Optically uniaxial positive, $\omega = 1.717(3)$, $\varepsilon = 1.802(5)$, nonpleochroic. The X-ray powder pattern (114 Gandolfi, Cu$K\alpha$ radiation) was indexed on a tetragonal cell consistent with space group $I4_1/amd$; $a = 6.866(2)$, $c = 6.004(3)$ Å. Strongest lines are 4.515(70,011), 3.437(100,020), 2.556(80,112), and 1.760(50,132).

The mineral is associated with muscovite, ferrocolumbite, albite, microcline, and quartz in a granitic pegmatite near the margin of the Lac du Bonnet batholith, Township 16, Range 15. Type material is in the R.B. Ferguson Museum of Mineralogy at the University of Manitoba, and in the Royal Ontario Museum, Toronto. **J.L.J.**

$(Rh,Ni)_7As_4$

T.W. Weiser, H.-G. Bachmann (1999) Platinum-group minerals from the Aikora River area, Papua New Guinea. Can. Mineral., 37, 1131–1145.

Large lamellae of Pt-Fe alloy intergrown with osmium contain tabular inclusions, up to 25 μm long, for which an electron microprobe analysis gave Ru 0.23, Rh 55.36, Pd 1.01, Ir 2.30, Pt 4.10, Fe 0.70, Ni 6.71, As 31.22, sum 101.63 wt%, corresponding to $(Rh_{5.25}Pt_{0.20}Ir_{0.12}Pd_{0.09}Ru_{0.02}Ni_{1.12}Fe_{0.12})_{\Sigma 6.89}As_{4.07}$ or $(Rh,Ni)_7As_4$.

Discussion. Analyses are also given for unnamed $Ir(Ni,Fe,Cu)_2S_3$ (see *Am. Mineral.*, 81, p. 1515, 1996), for $(Rh,Ni)_2As$ (rhodarsenide, *Am. Mineral.*, 83, p. 909, 1998), and for (Ru,Os,Ir)O and $(Ru,Os,Ir)O_2$ (*Am. Mineral.*, 84, p. 197, 1999, and 82, p. 1263, 1997). **J.L.J.**

Ir oxide-hydroxide, PGM

S.S. Gornostayev, J.H. Crocket, A.G. Mochalov, K.V.O. Laajoki (1999) The platinum-group minerals of the Baimka placer deposits, Aluchin horst, Russian Far East. Can. Mineral., 37, 1117–1129.

Two electron microprobe analyses are given for grains, a few micrometers across, whose totals are ~83 wt% PGE, but which also contain oxygen. The formula may be $(Ir,Rh)O(OH)\cdot H_2O$. The mineral occurs within vermicular holes in native platinum. Analyses are also listed for various unidentified inclusions, 4–30 μm across, whose compositions correspond to $(Pt_{1.54}Rh_{1.08}Pd_{0.57}Ir_{0.25})_{\Sigma 3.44}(Cu_{0.59}Fe_{0.06})_{\Sigma 0.65}As_{0.91}$, $(Pt_{2.67}PGE_{0.31})_{\Sigma 2.98}(Cu_{0.80}Fe_{0.20}Ni_{0.01})_{\Sigma 1.01}$, and $(Cu_{0.79}Rh_{0.11}Pt_{0.07}Fe_{0.04}Ir_{0.01})_{\Sigma 1.02}S_{0.98}$.

Discussion. Similar compositions of Ir-dominant oxide-hydroxide minerals have been reported in *Explor. Mining Geol.*, 5, p. 167 (1996). Data for Pt_3Cu were abstracted in *Am. Mineral.*, 78, 1110–1111(1993). In the absence of additional data for these and many other PGM in the literature, correlations and identifications are mainly speculations. **J.L.J.**

$LaAsO_4$, $NdAsO_4$

R. Cabella, G. Lucchetti, P. Marescotti (1999) Occurrence of *LREE*- and y-arsenates from a Fe-Mn deposit, Ligurian Briançonnais Domain, Maritime Alps, Italy. Can. Mineral., 37, 961–972.

The minerals occur as round to irregular microcrystalline aggregates, and rarely as isolated prismatic crystals up to 10 μm long, within microveins and microcavities, associated mainly with hematite-braunite-quartz and cryptomelane-group minerals. Compositions of the REE minerals correspond to those of chernovite-(Y) and the La and Nd analogs of chernovite or of gasparite-(Ce). One of two listed electron microprobe analysis for the Nd analog, and one of 12 listed analyses for the La analog, gave, respectively, As_2O_5 39.83, 39.51, V_2O_5 2.22, 0.66, P_2O_5 0.03, 0.75, SiO_2 0.02, 0.04, La_2O_3 3.85, 28.83, Ce_2O_3 1.09, 9.11, Pr_2O_3 11.27, 10.76, Nd_2O_3 37.05, 8.97, Eu_2O_3 0.13, <0.06, Gd_2O_3 0.47, 0.46, Y_2O_3 1.21, 0.25, ThO_2 0.88, 0.38, CaO 1.78, 0.20, sum 99.83, 99.92 wt%, corresponding to $(Nd_{0.60}Pr_{0.19}Ca_{0.09}La_{0.06}Y_{0.03}Ce_{0.02}Gd_{0.01}Th_{0.01})_{\Sigma 1.01}(As_{0.95}V_{0.07})_{\Sigma 1.02}O_4$ and $(La_{0.49}Pr_{0.18}Ce_{0.15}Nd_{0.15}Gd_{0.01}Y_{0.01}Ca_{0.01})_{\Sigma 1.00}(As_{0.95}P_{0.03}V_{0.02})_{\Sigma 1.00}O_4$. **J.L.J.**

New Data

Calciosamarskite

S.L. Hanson, W.B. Simmons, A.U. Falster, E.E. Foord, F.E. Lichte (1999) Proposed nomenclature for samarskite-group minerals: new data on ishikawaite and calciosamarskite. Mineral. Mag., 63, 27–36.

The abstract in *Am. Mineral.*, 84, p. 1467, 1999, prompted further discussion by several participants, including the Vice-Chairman and Chairman of the CNMMN. It was agreed by all that the formula of the samarskite-group minerals is of the type ABO_4 rather that $A_3B_5O_{15}$. Although the status of calciosamarskite had been questioned in a CNMMN-approved paper on nomenclature (*Am. Mineral.*, 62, p. 406, 1977), the mineral had not been officially discredited; thus, calciosamarskite is a valid species. **J.L.J.**

Discredited Mineral

Platynite

D. Holstam, J. Söderhielm (1999) The discreditation of platynite. Can. Mineral., 37, 1313–1315.

Platynite from Falun, Sweden, was originally described in 1910 and commonly has been assigned the formula $PbBi_2(Se,S)_3$. Although a mineral with such a formula may exist, reexamination of the type specimens has shown them to consist of a mixture of laitakarite and galena. The discreditation of platynite has been approved by the CNMMN. **J.L.J.**