

NEW MINERAL NAMES*

JOHN L. JAMBOR

Department of Earth Sciences, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada

ANDREW C. ROBERTS

Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0G1, Canada

Abenakiite-(Ce)*

A.M. McDonald, G.Y. Chao (1994) Abenakiite-(Ce), a new silicophosphate carbonate mineral from Mont Saint-Hilaire, Quebec: Description and structure determination. *Can. Mineral.*, 32, 843–854.

The mineral occurs as a single, ellipsoidal grain, 1 × 2 mm, in a xenolith of sodalite syenite in nepheline syenite at the Poudrette quarry, Mont-Saint-Hilaire. Electron microprobe analysis gave Na₂O 25.32, Ce₂O₃ 15.31, La₂O₃ 5.94, Nd₂O₃ 7.78, Pr₂O₃ 2.02, Sm₂O₃ 0.74, ThO₂ 1.42, SrO 0.12, SiO₂ 13.30, P₂O₅ 14.11, SO₂ 2.28, CO₂(calc) 8.91, sum 97.24 wt%, corresponding to Na_{24.23}(Ce_{2.77}Nd_{1.37}La_{1.08}Pr_{0.36}Th_{0.16}Sm_{0.13}Sr_{0.03})_{25.90}Si_{6.56}P_{5.90}C₆S_{1.06}O₆₃, ideally Na₂₆REE₆(SiO₃)₆(PO₄)₆(CO₃)₆(SO₂)O. Pale brown color, white streak, vitreous luster, transparent, *H* = >4, brittle, conchoidal fracture, poor {0001} cleavage, nonfluorescent, effervesces weakly in 1:1 HCl, *D*_{meas} = 3.21(2), *D*_{calc} = 3.27 g/cm³ for *Z* = 3. Optically uniaxial negative, *ω* = 1.589(1), *ε* = 1.586(1). Single-crystal X-ray structure study (*wR* = 0.03) indicated rhombohedral symmetry, space group *R* $\bar{3}$; *a* = 16.018(2), *c* = 19.761(6) Å as refined from the powder pattern (114-mm Gandolfi, CuK α radiation) with strongest lines of 11.414(75,101), 8.036(85,012), 6.554(85,003,021), 4.646(75,104,122,030), 3.773(90,303,131), 3.591(80,214,312), 3.150(70,125), and 2.674 (100,036,330).

Closely associated minerals are aegirine, eudialyte, mangan-neptunite, polythionite, serandite, and steenstrupine-(Ce); abenakiite-(Ce) is coated by an unidentified rhabdophane-group mineral. The new name relates to the Abenaki Indian tribe, which inhabited the area around Mont-Saint-Hilaire. The new mineral was previously designated as UK85. Type material is in the Canadian Museum of Nature, Ottawa, Ontario. J.L.J.

Gaultite*

T.S. Ercit, J. van Velthuisen (1994) Gaultite, a new zeolite-like mineral species from Mont Saint-Hilaire, Quebec, and its crystal structure. *Can. Mineral.*, 32, 855–863.

The mineral occurs as euhedral crystals to 0.5 mm in a cavity in a sodalite inclusion at the contact between

hornfels and nepheline-sodalite syenite at the Poudrette quarry. Colorless to pale mauve, transparent, white streak, vitreous luster, *H* = ~6, brittle; perfect {101} and {010} cleavages, and poor {021} cleavage. Crystals are multifaceted, with predominant forms {010}, {110}, $\bar{1}$ 10}, {021}, {151}, and {1 $\bar{5}$ 1}. Fluoresces bright apple-green in short-wave ultraviolet light; not readily soluble in 1:1 HCl; *D*_{meas} = 2.52(4), *D*_{calc} = 2.52 g/cm³ for *Z* = 8. Electron microprobe analysis gave Na₂O 16.6, ZnO 19.2, SiO₂ 52.6, H₂O (calc.) 11.3, sum 99.7 wt%, corresponding to an empirical formula Na_{4.28}Zn_{1.88}Si_{6.99}O₁₈·5H₂O, ideally Na₄Zn₂Si₇O₁₈·5H₂O. The infrared pattern is like that of stilbite. Optically biaxial positive, *α* = 1.520(1), *β* = 1.521(1), *γ* = 1.524(1), 2*V*_{meas} = 61.3(4), 2*V*_{calc} = 60°, *X* = *a*, *Y* = *c*, *Z* = *b*. Single-crystal X-ray structure study (*R* = 0.025) indicated orthorhombic symmetry, space group *F*2*dd*, *a* = 10.211(3), *b* = 39.88(2), *c* = 10.304(4) Å as refined from a 114-mm Gandolfi pattern (Cu radiation) with strongest lines of 6.35(100,131), 4.96(30,080,220), 3.240(60,113,1.11.1), 3.167(40,262,133), 3.140(40,2.10.0,331), and 2.821(30,173,1.13.1).

The new name is for R.A. Gault (b. 1943) of the Canadian Museum of Nature, Ottawa, Canada, which is the repository for type material. The mineral corresponds to UK84 in previous partial descriptions. J.L.J.

Kintoreite*

A. Pring, W.D. Brich, J. Dawe, M. Taylor, M. Deliens, K. Walenta (1995) Kintoreite, PbFe₃(PO₄)₂(OH,H₂O)₆, a new mineral of the jarosite-alunite family, and lusungite discredited. *Mineral. Mag.*, 59, 143–148.

Electron microprobe analysis (average of six) gave CuO 0.25, ZnO 1.58, PbO 31.37, BaO 0.09, Al₂O₃ 0.02, Fe₂O₃ 34.01, P₂O₅ 13.30, As₂O₅ 6.43, SO₃ 2.02, CO₂ and H₂O (CHN analyses) 0.73 and 9.0, respectively, sum 98.90 wt%, corresponding to Pb_{0.97}(Fe_{2.95}Zn_{0.13}Cu_{0.02})_{23.10}[(PO₄)_{1.30}(AsO₄)_{0.39}(SO₄)_{0.18}(CO₃)_{0.11}]_{21.98}(OH)_{5.45}·0.74H₂O, ideally PbFe₃(PO₄)₂(OH,H₂O)₆. Occurs as clusters and coatings of cream to yellowish green and brownish yellow crystals to several millimeters in height, typically with well-defined rhombohedra {112}; also as waxy, yellowish green globular crusts and hemispheres on other phosphate minerals. Crystals are translucent, vitreous to adamantine luster, and globules are transparent to translucent, with a greasy to waxy luster. Streak pale yellowish green, *H* = ~4, good {001} cleavage, brittle, rough fracture, *D*_{meas} =

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

>4.2, $D_{\text{calc}} = 4.34 \text{ g/cm}^3$ for $Z = 3$. Optically uniaxial negative, refractive indices between 1.935 and 1.955, pleochroic from light yellowish green to medium yellow. The X-ray powder pattern (Guiner-Hägg 100-mm camera, $\text{CuK}\alpha$ radiation) has strongest lines of 5.96(90,101), 3.67(60,110), 3.07(100,113), 2.971(40,202), 2.818(40,006), 2.538(50,024), 2.257(50,107), 1.979(50,303), and 1.831(40,220). Indexing by analogy with beudantite, from which $a = 7.325(1)$, $c = 16.900(3) \text{ \AA}$, space group $R\bar{3}m$.

The mineral occurs with segnitite, goethite, pyromorphite, mimetite, hinsdalite, libethenite, and apatite in the Kintore open pit (hence the new name) in oxidized parts of the Broken Hill Pb-Zn ore bodies, New South Wales, Australia, and at the Clara and Igelschlatt mines near Oberwolfach and Grafenhausen, respectively, in Germany. Type material (Kintore) is in the South Australian Museum and in the Museum of Victoria, Australia.

Discussion. See also the abstract on lusungite. J.L.J.

Mccrillite,* gainesite

E.E. Foord, M.E. Brownfield, F.E. Lichte, A.M. Davis, S.J. Sutley (1994) Mccrillite, $\text{NaCs}(\text{Be,Li})\text{Zr}_2(\text{PO}_4)_4 \cdot 1-2\text{H}_2\text{O}$, a new mineral species from Mount Mica, Oxford County, Maine, and new data for gainesite. *Can. Mineral.*, 32, 839-842.

The mineral occurs sparingly as white to colorless bi-pyramidal crystals up to 1.2 mm long in cavities in a granitic pegmatite. Translucent to transparent, white streak, vitreous luster, conchoidal fracture, $H = 4-4\frac{1}{2}$, nonfluorescent, $\{111\}$ dominant and $\{001\}$ minor, $D_{\text{meas}} = 3.125(5)$, $D_{\text{calc}} = 3.30 \text{ g/cm}^3$ for $Z = 2$. Optically uniaxial positive, $\omega = 1.634(2)$, $\epsilon = 1.645(2)$. Electron and ion microprobe, and laser-ablation ICP-MS analyses gave Li_2O 0.6, BeO 2.9, Na_2O 4.2, K_2O 0.3, Cs_2O 15.3, MgO 0.1, SrO 0.2, ZnO 0.5, ZrO_2 31.6, HfO_2 2.5, SiO_2 0.1, P_2O_5 38.3, H_2O 3.0, F 0.5, $\text{F} = \text{O}$ 0.21, sum 99.89 wt%, corresponding to $\text{Na}_{1.00}(\text{Cs}_{0.80}\text{Li}_{0.18}\text{K}_{0.05})_{\Sigma 1.03}(\text{Be}_{0.86}\text{Li}_{0.12}\text{Mg}_{0.02})_{\Sigma 1.00}(\text{Zr}_{1.90}\text{Hf}_{0.09}\text{Zn}_{0.05})_{\Sigma 2.04}(\text{P}_{4.00}\text{Si}_{0.01})_{\Sigma 4.01}(\text{O}_{15.8}\text{F}_{0.2})_{\Sigma 16.0}$. Single-crystal X-ray study indicated tetragonal symmetry, $I4_1/amd$, $a = 6.573(2)$, $c = 17.28(2) \text{ \AA}$ as refined from the powder pattern (114-mm Gandolfi, $\text{CuK}\alpha$ radiation) with strongest lines of 6.159(90,101), 4.326(80,004), 4.099(40,112), 3.281(80,200), 3.060(100,105), 2.896(30,211), and 1.849(30,305).

The mineral formed by late-stage hydrothermal alteration of predecessor Zr-bearing minerals in the pegmatite, especially zircon. The new name is for the McCrillite family of Oxford County, Maine, who have worked the pegmatites of Maine for almost a century. Type material is in the U.S. National Museum (Smithsonian Institution), Washington. Mccrillite is the Cs member of the gainesite group.

Gainesite

A new, complete analysis of cotype gainesite gave 4.3 wt% H_2O , confirming that the members of the gainesite

group (mccrillite, gainesite, and selwynite) are hydrated, with 1-2 molecules of formula H_2O . The formula of gainesite should be revised accordingly. J.L.J.

Morimotoite*

C. Henmi, I. Kusachi, K. Henmi (1995) Morimotoite, $\text{Ca}_3\text{TiFe}^{2+}\text{Si}_3\text{O}_{12}$, a new titanian garnet from Fuka, Okayama Prefecture, Japan. *Mineral. Mag.*, 59, 115-120.

The mineral occurs as black, euhedral to subhedral grains to 15 mm, with or without rims of grossular-andradite. Adamantine luster, no cleavage, $H = 7.5$, $D_{\text{meas}} = 3.75(2)$, $D_{\text{calc}} = 3.80 \text{ g/cm}^3$. Optically isotropic, $n = 1.955(2)$. Electron microprobe analysis gave SiO_2 26.93, TiO_2 18.51, ZrO_2 1.48, Al_2O_3 0.97, Fe_2O_3 11.42, FeO 7.78, MnO 0.23, MgO 0.87, CaO 31.35, sum 99.54 wt%, corresponding to $(\text{Ca}_{2.89}\text{Mg}_{0.11})_{\Sigma 3.00}(\text{Ti}_{1.20}\text{Fe}_{0.56}^{2+}\text{Fe}_{0.16}^{3+}\text{Zr}_{0.06}\text{Mn}_{0.02})_{\Sigma 2.00}(\text{Si}_{2.32}\text{Fe}_{0.58}^{3+}\text{Al}_{0.10})_{\Sigma 3.00}\text{O}_{12}$, simplified as $\text{Ca}_3(\text{Ti},\text{Fe}^{2+},\text{Fe}^{3+})_2(\text{Si},\text{Fe}^{3+})_3\text{O}_{12}$. Crystals are generally homogeneous in composition at the core but vary in the rims. Single-crystal X-ray study indicated cubic symmetry, space group $Ia\bar{3}d$, $a = 12.162(3) \text{ \AA}$ as refined from the powder pattern with strongest lines of 3.039(72,400), 2.720(100,420), 2.483(51,422), 1.687(26,640), and 1.626(56,642).

The new mineral, named for Nobuo Morimoto (b. 1925) of Osaka University, is derived from the formula of andradite, $\text{CaFe}_3^{2+}\text{Si}_3\text{O}_{12}$, by the substitution $\text{Ti} + \text{Fe}^{2+} = 2\text{Fe}^{3+}$. The mineral, which is associated with calcite, vesuvianite, grossular, wollastonite, prehnite, perovskite, and other minerals, was formed in limestone intruded by quartz monzonite dykes. Type material is in the National Science Museum, Tokyo, Japan. J.L.J.

Peterbaylissite*

A.C. Roberts, T.S. Ercit, L.A. Groat, A.J. Criddle, R.C. Erd, R.S. Williams (1995) Peterbaylissite, $\text{Hg}_3^{2+}(\text{CO}_3)_2(\text{OH}) \cdot 2\text{H}_2\text{O}$, a new mineral species from the Clear Creek claim, San Benito County, California. *Can. Mineral.*, 33, 47-56.

The mineral occurs as clustered and isolated crystals, up to 0.2 mm long, on ferroan magnesite and quartz. Crystals are euhedral to subhedral, wedge-shaped, slightly elongate [001]; also rarely platy. Black to dark red-brown color, opaque, dark brown to black streak, submetallic to adamantine luster, brittle, irregular fracture, $H = <5$, nonfluorescent, $D_{\text{calc}} = 7.14 \text{ g/cm}^3$ for $Z = 8$, becomes transparent without effervescence in concentrated HCl. In reflected light, gray with a slight blue tinge, nonpleochroic, weakly to moderately birefractant, internal reflections from yellow-white to orange, weakly anisotropic with polarization colors dull dark gray and brown, average $n = 2.10$ (589 nm) calculated from reflectance spectra; reflectance percentages for R_1 and R_2 in air and in oil are, respectively, 11.4, 12.15, 2.02, 2.35 (470 nm), 10.95, 11.6, 1.88, 2.15 (546), 10.9, 11.5, 1.85, 2.11 (589), and 10.7,

11.2, 1.82, 2.04 (650). Single-crystal X-ray study indicated orthorhombic, pseudotetragonal symmetry, space group $Pcab$, $a = 11.130(2)$, $b = 11.139(3)$, $c = 10.725(3)$ Å as refined from the powder pattern (114-mm Debye-Scherrer, $CuK\alpha$ radiation) with strongest lines of 4.84(50,012), 2.969(70,231), 2.786(40,040,400), 2.648(100,223), and 2.419(60,241,024,412). Electron microprobe analysis gave Hg_2O 87.4, with CO_2 and H_2O derived from crystal-structure analysis (in preparation); theoretical contents for $Hg_3(CO_3)(OH)\cdot 2H_2O$ are Hg_2O 87.54, CO_2 6.16, H_2O 6.30 wt%. The presence of H_2O , OH , and CO_3 was confirmed by infrared spectroscopy.

The mineral occurs on a single specimen from a prospect pit near the former Clear Creek mercury mine, New Idria district, San Benito County. The new name is for Peter Bayliss, University of Calgary. Type material is in the Systematic Reference Series of the National Mineral Collection, Geological Survey of Canada, Ottawa, and a polished section is in the Natural History Museum, London, Great Britain. J.L.J.

Selwynite*

W.D. Birch, A. Pring, E.E. Foord (1995) Selwynite, $NaK(Be,Al)Zr_2(PO_4)_4\cdot 2H_2O$, a new gainesite-like mineral from Wycheproof, Victoria, Australia. *Can. Mineral.*, 33, 55–58.

The mineral occurs as intergrowths of indistinct radiating crystals and as granular aggregates that fill cavities up to 8 mm across in quartz-orthoclase-albite-muscovite-schorl pegmatitic veins, 4–12 cm wide, that cut Devonian granite. Deep purplish blue color, transparent, vitreous luster, pale lavender streak, semiconchoidal fracture, $H = 4$, nonfluorescent, $D_{meas} = 2.94$, $D_{calc} = 3.08$ g/cm³ for $Z = 2$. Optically uniaxial positive, $\omega = 1.624(2)$, $\epsilon = 1.636(2)$; distinctly pleochroic, with $O =$ medium bluish lavender, $E =$ pale bluish lavender. Electron microprobe, CHN, and ICP-MS analyses gave Na_2O 4.77, K_2O 6.26, Rb_2O 0.20, BeO 1.43, CaO 0.98, SrO 0.16, BaO 0.16, MgO 0.15, MnO 0.99, FeO 0.49, Cs_2O 0.70, Al_2O_3 1.04, Ce_2O_3 0.03, ZrO_2 33.76, HfO_2 1.17, P_2O_5 40.90, SiO_2 0.49, F 0.37, H_2O 5.4, $O = F$ 0.16, sum 99.29 wt%, corresponding to $Na_{1.00}(K_{0.92}Na_{0.06}Cs_{0.03}Rb_{0.02})_{21.03}(Be_{0.40}Al_{0.14}Ca_{0.12}Mn_{0.10}Fe_{0.05}Mg_{0.03}Sr_{0.01}Ba_{0.01})_{50.86}(Zr_{1.89}Hf_{0.04})_{21.93}(P_{3.98}Si_{0.06})_{24.04}O_{15.80}F_{0.13}\cdot 2.07H_2O$, simplified as $NaK(Be,Al)Zr_2(PO_4)_4\cdot 2H_2O$, which is the K analogue of gainesite and mcbrillite. The X-ray powder pattern was indexed by analogy with that of gainesite, from which $a = 6.570(3)$, $c = 17.142(6)$ Å, tetragonal symmetry, space group $I4_1/amd$. Strongest lines in the pattern (100-mm Guinier Hägg, $CuK\alpha$ radiation) are 6.161(100,101), 4.29(25,004), 3.286(50,200), 3.039(30,105), and 2.895(20,211).

Among the associated minerals are eosphorite, montmorillonite, and the Zr-bearing phosphates kosnarite and wycheproofite. Selwynite is interpreted to have crystallized directly from late-stage Zr-bearing fluids. The new name is for A.C.R. Selwyn (1824–1902), former Director

of the Geological Survey of Victoria (1860–1869) and the Geological Survey of Canada (1869–1894). Type material is in the Museum of Victoria, Melbourne, Australia. J.L.J.

Vanadomalayite*

R. Basso, G. Lucchetti, L. Zefiro, A. Palenzona (1994) Vanadomalayite, $CaVOSiO_4$, a new mineral vanadium analog of titanite and malayite. *Neues Jahrb. Mineral. Mon.*, 489–498.

Electron microprobe analysis gave CaO 28.33, MnO 0.07, VO_2 29.86, TiO_2 10.51, Fe_2O_3 0.46, Al_2O_3 0.27, SiO_2 30.47, sum 99.97 wt%, corresponding to $Ca_{1.00}(V_{0.71}Ti_{0.26}Fe_{0.01}Al_{0.01})OSi_{1.01}O_4$, ideally $CaVOSiO_4$. The mineral occurs as subhedral, prismatic, deep red, isolated grains up to 0.4 mm. Transparent, vitreous luster, red streak, good {110} cleavage, hardness not determinable, nonfluorescent, no twinning observed, $D_{meas} = 3.60(4)$, $D_{calc} = 3.61$ g/cm³ for $Z = 4$. Optically biaxial, $\alpha = \sim 1.95$, $\gamma = 2.105(5)$, strong dispersion, pleochroism $X \approx Y =$ brownish red-orange, $Z =$ deep greenish blue. Single-crystal X-ray structure study ($R = 0.026$) indicated monoclinic symmetry, space group $C2/c$; $a = 6.532(2)$, $b = 8.692(3)$, $c = 7.039(2)$ Å, $\beta = 113.88(1)^\circ$ by refinement of a Gandolfi powder pattern (Cu radiation) with strongest lines (calculated intensities) of 3.22(100,11 $\bar{2}$), 2.97(70,200), 2.59(63,130;44,022), 2.271(19,131;10,113), 2.057(9,041; 17,31 $\bar{2}$), and 1.641(23,330).

The mineral occurs sparingly in a small vein of calcite, quartz, and haradaite that cuts ophiolitic metacherts at the Gambatesa mine near the village of Reppia, Val Graveglia, northern Apennines, Italy. The new name indicates that the mineral is the V analogue of malayite. Type material is in the Dipartimento di Scienze della Terra, Sezione di Mineralogia, Università di Genova, Italy. J.L.J.

Ag-Sn-S mineral

S. Ono, J. Sato (1994) Ore minerals and fluid inclusions from veins in the northwestern part of the Toyoha Pb-Zn-Ag mining district, Hokkaido, Japan. *Resource Geology*, 44(5), 369–378.

In one of the veins at the Toyoha mine, Sapporo, Japan, round to elongate inclusions of an Ag-Sn-S mineral occur in galena or are intergrown with galena and sphalerite. The inclusions are 10–50 μ m in size, gray with a greenish tint in reflected light in air, darker in oil, non-pleochroic, no anisotropism observed, polishing hardness greater than that of galena and less than that of sphalerite. Electron microprobe analysis (one of four listed) gave Ag 66.9, Cu 0.2, Pb 1.6, Sn 13.2, S 18.5, sum 100.4 wt%, corresponding to $Ag_{47.0}Cu_{0.2}Pb_{0.6}Sn_{8.4}S_{43.8}$. The composition is similar to that of canfieldite, but optical properties differ. J.L.J.

CuNiSb₂

Yu.K. Kabalov, E.V. Sokolova, E.M. Spiridonov, F.M. Spiridonov (1994) Crystal structure of the new mineral CuNiSb₂. *Doklady Akad. Nauk*, 335(6), 709–711 (in Russian).

The mineral occurs in the Zlatoja Hora deposit, Central Urals, as roundish to short prismatic grains to 300 μm, associated with native antimony, lead, cuprostibite, nisbite, seinäjokite, ullmannite, galena, and gudmundite. Silver-white color, metallic luster, $VHN_{50} = 290\text{--}310$, $D_{\text{meas}} = 8.21(4)$, $D_{\text{calc}} = 8.25 \text{ g/cm}^3$ for $Z = 1$. In reflected light, white with a yellowish tint, weak birefractance, distinct anisotropism. Reflectance percentages (R_1 , R_2) are 59.3, 52.4 (470 nm), 63.0, 56.8 (546), 65.5, 60.9 (589), and 68.6, 64.9 (650). From electron microprobe analysis (not given) the empirical formula is $\text{Cu}_{0.99}(\text{Ni}_{0.99}\text{Fe}_{0.01}\text{Co}_{0.01})_{21.01}(\text{Sb}_{1.95}\text{As}_{0.04})_{21.99}$. Rietveld refinement ($R_F = 0.035$) showed the mineral to be of the NiAs structure type, hexagonal, space group $P\bar{3}m1$, $a = 4.0510(2)$, $c = 5.1382(4) \text{ \AA}$. J.L.J.

Cu(Re,Mo,Os)₅S₉

P. Peltonen, L. Pakkanen, B. Johanson (1995) Re-Mo-Cu-Os sulfide from the Ekojoki Ni-Cu deposit, SW Finland. *Mineral. Petrology*, 52, 257–264.

The mineral occurs as a single, euhedral grain, $4 \times 8 \mu\text{m}$, enclosed in pentlandite containing wormlike mackinawite. The grain is four-sided, with the sides intersecting at 110° (obtuse angle). Light gray in reflected light, reflectance estimated to be about 35%; pleochroism, anisotropism, and zoning not observed. Electron microprobe analysis gave Fe 3.19, Ni 1.32, Cu 5.43, Mo 12.69, Re 48.23, Os 2.89, S 26.63, sum 100.37 wt%; if the Fe and Ni are attributed to fluorescence effects from pentlandite and mackinawite, the formula is $\text{Cu}_{1.02}(\text{Re}_{3.11}\text{Os}_{0.18}\text{Mo}_{1.59})_{24.88}\text{S}_9$. The simplified formula is $\text{Cu}(\text{Re,Mo,Os})_5\text{S}_9$, similar to that of previously reported unnamed mineral(s) $(\text{Re,Mo,Cu,Fe})_2\text{S}_3$ or $(\text{Cu,Fe})(\text{Re,Mo})_4\text{S}_8$. The grain is from the Proterozoic Ekojoki ultramafic intrusion, southern Finland.

Discussion. See also the abstract for ReS_n in *Am. Mineral.*, 80, p. 406 (1995). J.L.J.

Fe₂TlAs₃O₁₂·4H₂O

E. Frantz, H. Palme, W. Todt, A. El Goresy, M. Pavičević (1994) Geochemistry of Tl-As minerals and host rocks at Allchar (FYR Macedonia). *Neues Jahrb. Mineral. Abh.*, 167, 359–399.

Among the Tl-As minerals of the Crven Dol deposit at Allchar is one that occurs within realgar as radial to colloform aggregates up to 300 μm in diameter. Electron microprobe analyses for the radial and colloform types gave, respectively, Fe 18.36, 17.2, Tl 29.27, 26.63, As 37.16, 39.28, S 4.13, 4.03, sum 88.93, 87.13 wt%, possibly corresponding to $\text{Fe}_2\text{Tl}(\text{As}_{0.85}\text{S}_{0.15})_3\text{O}_{12} \cdot 4\text{H}_2\text{O}$. J.L.J.

New Data**Aurichalcite**

M.M. Harding, B.M. Kariuki, R. Cernik, G. Cressey (1994) The structure of aurichalcite, $(\text{Cu,Zn})_3(\text{OH})_6(\text{CO}_3)_2$, determined from a microcrystal. *Acta Crystallogr.*, B50, 673–676.

Structure determination ($R = 0.061$) of a twinned crystal of aurichalcite, 5 μm thick, showed that the symmetry is monoclinic, space group $P2_1/m$, $a = 13.82(2)$, $b = 6.419(3)$, $c = 5.29(3) \text{ \AA}$, $\beta = 101.04(2)^\circ$, $D_{\text{calc}} = 3.93 \text{ g/cm}^3$ for $Z = 2$. The symmetry is new. J.L.J.

Bolivarite, evansite

J. García-Guinea, A. Millán Chagoyen, E.H. Nickel (1995) A re-investigation of bolivarite and evansite. *Can. Mineral.*, 33, 59–65.

The name bolivarite was introduced in 1921 for a mineral from Campo Lameiro, Pontevedra, Spain, with a formula close to $\text{Al}_2(\text{PO}_4)(\text{OH})_3 \cdot \text{H}_2\text{O}$; much later analyses showed up to $5\text{H}_2\text{O}$. Evansite was introduced in 1864 for a similar mineral from Mount Železník, Gömör, Slovakia, with the accepted formula $\text{Al}_3(\text{PO}_4)(\text{OH})_6 \cdot \text{H}_2\text{O}$. Examination of type specimens of bolivarite and evansite showed both to be X-ray amorphous and to have almost identical physical properties and infrared and NMR spectra. Chemical analyses of additional specimens from the Pontevedra area, Spain, gave Al:P atomic ratios from 2.44 to 3.58, thus overlapping the Al:P of evansite. Although evansite has historical priority, it is difficult to discredit bolivarite because of the lack of crystallographic data. "It seems, therefore, that . . . these names will continue to exist in the mineralogical limbo reserved for inadequately characterized minerals." J.L.J.

Fichtelite

H.A. Mace, R.C. Peterson (1995) The crystal structure of fichtelite, a naturally occurring hydrocarbon. *Can. Mineral.*, 33, 7–11.

Single-crystal X-ray structure study ($R = 0.046$) of fichtelite gave monoclinic symmetry, space group $P2_1$, $a = 10.706(4)$, $b = 7.458(2)$, $c = 10.824(7) \text{ \AA}$, $\beta = 105.85(3)^\circ$, $D_{\text{calc}} = 0.631 \text{ g/cm}^3$ for $2[\text{C}_{15}\text{H}_{34}]$. The cell dimensions (and density) are new J.L.J.

Namibite

Z. Mrázek, F. Veselovský, J. Hloušek, H. Moravcová, P. Ondruš (1994) Redefinition of namibite, $\text{Cu}(\text{BiO})_2\text{VO}_4\text{OH}$. *Neues Jahrb. Mineral. Mon.*, 481–488.

Namibite from Namibia was originally defined as $\text{Cu-Bi}_2\text{VO}_6$. In new occurrence at Jáchymov, Czech Republic, namibite is present as spherical aggregates consisting

of tabular to columnar crystals up to 0.3 mm, elongate [010], flattened on (001), perfect {001} cleavage, $D_{\text{calc}} = 6.91 \text{ g/cm}^3$ for $Z = 2$. Wet-chemical analysis gave Cu 12.03, Bi_2O_3 72.24, V_2O_5 13.77, H_2O 1.51, sum 99.55 wt%, corresponding to $\text{Cu}_{0.98}(\text{BiO})_{2.01}(\text{VO}_4)_{0.98}(\text{OH})_{1.03} \cdot 0.03\text{H}_2\text{O}$, ideally $\text{Cu}(\text{BiO})_2\text{VO}_4\text{OH}$. The mineral was synthesized hydrothermally at 200 °C, and infrared spectra of the natural and synthetic phases are in good agreement; absorption bands at 1032, 1083, and 1102 cm^{-1} correspond to the bending vibration of Cu-OH bands, and several strong absorption bands are attributable to the presence of V as VO_4 . The new formula indicates that namibite is a hydroxo-vandate. **J.L.J.**

Parakhinite

P.C. Burns, M.A. Cooper, F.C. Hawthorne (1995) Parakhinite, $\text{Cu}_3^{2+}\text{PbTe}^{6+}\text{O}_6(\text{OH})_2$: Crystal structure and revision of chemical formula. *Can. Mineral.*, 33, 33–40.

Single-crystal X-ray structure study ($R = 0.081$) of twinned parakhinite from the Emperor mine, Tombstone, Arizona (type locality), gave trigonal symmetry, $a = 5.765(2)$, $c = 18.001(9) \text{ \AA}$, formula as given above, $D_{\text{calc}} = 6.302 \text{ g/cm}^3$ for $Z = 3$. The symmetry and formula are new. **J.L.J.**

Synchysite-(Ce)

L. Wang, Y. Ni, J.M. Hughes, P. Bayliss, J.W. Drexler (1994) The atomic arrangement of synchysite-(Ce), $\text{Ce-CaF}(\text{CO}_3)_2$. *Can. Mineral.*, 32, 865–871.

Single-crystal X-ray structure study ($R = 0.036$) of synchysite-(Ce) showed the symmetry to be monoclinic, space group $C2/c$, $a = 12.329(2)$, $b = 7.110(1)$, $c = 18.741(2) \text{ \AA}$, $\beta = 102.68(1)^\circ$. **J.L.J.**

Discredited Minerals

Arizonite, leucoxene, kleberite

I.E. Grey, J.A. Watts, P. Bayliss (1994) Mineralogical nomenclature: Pseudorutile revalidated and neotype given. *Mineral. Mag.*, 58, 597–600.

Although arizonite and leucoxene have historical priority over pseudorutile, neither has been adequately defined. Arizonite and leucoxene are considered to be mixtures. The X-ray powder pattern of kleberite can be satisfactorily indexed using the substructure cell of pseudorutile, and the chemical composition of kleberite can be recast to that of a hydroxylan pseudorutile. The proposal that arizonite, proarizonite (previously rejected), leucoxene, and kleberite are not valid mineral names has been accepted by the CNMMN. **J.L.J.**

Lusungite*

A. Pring, W.D. Birch, J. Dawe, M. Taylor, M. Deliens, K. Walenta (1995) Kintoreite, $\text{PbFe}_3(\text{PO}_4)_2(\text{OH},\text{H}_2\text{O})_6$, a new mineral of the jarosite-alunite family, and lusungite discredited. *Mineral. Mag.*, 59, 143–148.

Lusungite was originally described as $(\text{Sr},\text{Pb})\text{Fe}_3^{3+}(\text{PO}_4)_2(\text{OH})_2 \cdot \text{H}_2\text{O}$. Electron microprobe analysis of holotype material gave PbO 0.04, CaO 0.45, SrO 18.65, BaO 0.26, Al_2O_3 31.58, Fe_2O_3 0.82, P_2O_5 27.57 wt%, corresponding to $(\text{Sr}_{0.93}\text{Ca}_{0.04}\text{Ba}_{0.01})_{20.98}(\text{Al}_{3.19}\text{Fe}_{0.05})_{23.24}(\text{PO}_4)_2$, and indicating that the mineral is goyazite. The discreditation of lusungite has been approved by the CNMMN, and what was previously referred to as the lusungite group in the alunite-jarosite family is renamed the segnitite group. **J.L.J.**