

NEW MINERAL NAMES*

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Calcioaravaipaita*

A.R. Kampf, E.E. Foord (1996) Calcioaravaipaita, a new mineral, and associated lead fluoride minerals from the Grand Reef mine, Graham County, Arizona. Mineral Record, 27, 293–300.

The mineral occurs as rectangular, twinned crystals, up to $0.5 \times 0.3 \times 0.7$ mm, and as compact, massive, white material in a 5×15 mm vug in a single specimen. Crystals are colorless, transparent, vitreous, elongate [011], flattened on prominent {100}. White streak, brittle, conchoidal fracture, good {100} cleavage, $H = 2 \frac{1}{2}$, non-fluorescent, slowly soluble in H₂O and in 1:1 HCl, $D_{\text{meas}} = 4.85(5)$, $D_{\text{calc}} = 4.71$ g/cm³ with $Z = 8$. Optically biaxial negative, $\alpha = 1.510(1)$, $\beta = 1.528(1)$, $\gamma = 1.531(1)$, $2V_{\text{meas}} = 36(2)$, $2V_{\text{calc}} = 44^\circ$, strong $r > v$ dispersion, $Y = b$, $Z.c = 73^\circ$ in obtuse β . Electron microprobe analysis gave PbO 46.4, CaO 23.5, Al₂O₃ 10.8, F 30.9, H₂O by difference 1.4 (by titration, 0.7), O \equiv F 13.0, sum 100 wt%, corresponding to $\text{Pb}_{1.02}\text{Ca}_{2.05}\text{Al}_{1.04}[\text{F}_{7.97}(\text{OH})_{0.76}\text{O}_{0.27}]_{29.00}$, ideally $\text{PbCa}_2\text{Al}(\text{F},\text{OH})_8$. Single-crystal X-ray study indicated monoclinic symmetry, space group $A2$, Am , or $A2/m$, $a = 23.905$, $b = 7.516(2)$, $c = 7.699(2)$ Å, $\beta = 92.25(2)^\circ$. Strongest lines of the powder pattern (114 mm Gandolfi, CuK α radiation) are 11.9(100,200), 3.71(85,511,302), 2.981(60,800), 2.943(60,502), 2.028(60,822), and 1.971(60,822).

The mineral is associated with anglesite, fluorite, galena, and artroite in quartz from the oxidized ore of the Pb-Ag-Cu Grand Reef mine, near Klondyke, Arizona. The new name alludes to the relationship to aravaipaita, which is Pb dominant. Type material is in the Natural History Museum of Los Angeles County, CA. J.L.J.

Christelite*

J. Schlüter, K.-H. Klaska, G. Adiwidjaja, G. Gebhard (1996) Christelite, $\text{Zn}_3\text{Cu}_2(\text{SO}_4)_2(\text{OH})_6 \cdot 4\text{H}_2\text{O}$, a new mineral from the San Francisco mine, Antofogasta, Chile. Neues Jahrb. Mineral. Mon., 188–192.

The mineral occurs as thin, greenish blue, transparent crystals, up to 4×13 mm, flattened on {010}. Vitreous luster, bright greenish blue streak, perfect {001} cleavage, H not stated, nonfluorescent, soluble in HCl and HNO₃,

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

$D_{\text{meas}} = 3.14$, $D_{\text{calc}} = 3.20$ g/cm³ for $Z = 1$. Optically biaxial negative, $\alpha = 1.5977$, $\beta = 1.6259$, $\gamma = 1.6354$, $2V_{\text{meas}} = 59.4$, $2V_{\text{calc}} = 59.00$; pleochroic, with $\alpha =$ pale blue, and β and $\gamma =$ blue. Electron microprobe and CHN analyses gave CuO 18.62, ZnO 36.25, SO₃ 23.53, H₂O 23.05, sum 101.45 wt%, corresponding to $\text{Zn}_{1.52}\text{Cu}_{0.80}(\text{SO}_4)(\text{OH})_{2.64} \cdot 1.84\text{H}_2\text{O}$, ideally $\text{Zn}_3\text{Cu}_2(\text{SO}_4)_2(\text{OH})_6 \cdot 4\text{H}_2\text{O}$. Single-crystal X-ray structure study indicated triclinic symmetry, space group $P\bar{1}$, $a = 5.422(1)$, $b = 6.347(1)$, $c = 10.490(1)$ Å, $\alpha = 94.38$, $\beta = 90.10$, $\gamma = 90.22^\circ$ as refined from a diffractometer pattern (CuK α radiation) with strongest lines of 10.459(82,001), 5.230(100,002), 3.486(54,003), 2.493(10,122), 2.355(10,122), and 1.743(12,006). The structure is similar to that of ktenasite.

The mineral is associated with its possible monoclinic polymorph and with anglesite, zincian paratacamite, hemimorphite, and quartz. The new name is for the mineral's discoverer, Christel Gebhard-Giesen. Type material is in the Mineralogical Museum of the University of Hamburg, Germany. J.L.J.

Gottardiite*

A. Alberti, G. Vezzalini, E. Galli, S. Quartieri (1996) The crystal structure of gottardiite, a new natural zeolite. Eur. J. Mineral., 8, 69–75.

Results of a single-crystal X-ray structure study are reported for gottardiite.

Discussion. The authors report that the description of the mineral has been submitted for publication but did not provide the name of the journal. The descriptive paper should have marked the introduction of the name. Partial data have been published as IMA proposal No. 94-054. J.L.J.

Jáchymovite*

J. Čejka, J. Sejkora, Z. Mrázek, Z. Urbanec, T. Jarchovský (1996) Jáchymovite, $(\text{UO}_2)_8(\text{SO}_4)(\text{OH})_{14} \cdot 13\text{H}_2\text{O}$, a new uranyl mineral from Jáchymov, the Krušné hory Mts., Czech Republic, and its comparison with uranopilite. Neues Jahrb. Mineral. Abh., 170, 155–170.

Wet-chemical analyses gave UO₃ 84.20, SO₃ 2.79, H₂O (TGA) 13.32, sum 100.31 wt%, corresponding to $(\text{UO}_2)_{8.01}(\text{SO}_4)_{0.95} \cdot 13.06\text{H}_2\text{O}$. Occurs as acicular crystals, up to 0.1 mm long, that form centimeters-wide coatings. Yellow color, vitreous luster, translucent, pale yellow

streak, H not determinable, brittle, conchoidal fracture, good $\{010\}$ cleavage, yellow fluorescence (254 and 366 nm), $D_{\text{calc}} = 4.79 \text{ g/cm}^3$ for $Z = 2$. Optically biaxial negative, $\alpha = 1.715(2)$, $\beta = 1.718(2)$, $\gamma = 1.720(2)$, $2V_{\text{calc}} = 78^\circ$, pleochroism $Y =$ pale yellow, $Z =$ yellow. Indexing of the X-ray powder pattern (diffractometer, $\text{CuK}\alpha$) indicated monoclinic symmetry, possible space groups $P12_11$ or $P12_1/m1$, $a = 18.553(8)$, $b = 9.276(2)$, $c = 13.532(7)$ Å, $\beta = 125.56(2)^\circ$. Strongest lines are 7.56(100,200), 7.13(48,101), 3.771(34,400), 3.554(20,503), 3.234(10,223), and 3.206(13,323).

The mineral is an oxidation product associated with gypsum, uranopilitite, and uraninite in the dolomite-uraninite veins at Jáchymov. The new name is for the locality. Type material is in the Natural History Museum of the National Museum at Prague, Czech Republic. **J.L.J.**

Leisingite*

A.C. Roberts, L.A. Groat, J.D. Grice, R.A. Gault, M.C. Jensen, E.A. Moffatt, J.A.R. Stirling (1996) Leisingite, $\text{Cu}(\text{Mg,Cu,Fe,Zn})_2\text{Te}^{6+}\text{O}_6 \cdot 6\text{H}_2\text{O}$, a new mineral species from the Centennial Eureka mine, Juab County, Utah. *Mineral. Mag.*, 60, 653–657.

Electron microprobe analysis gave an average and range of TeO_3 36.94 (36.49–37.61), CuO 24.71 (24.15–25.42), FeO 6.86 (6.75–6.96), ZnO 0.45 (0.32–0.64), MgO 6.19 (6.12–6.30), H_2O (calc.) 21.55, sum 96.70 wt%, corresponding to $\text{Cu}_{1.00}(\text{Mg}_{0.77}\text{Cu}_{0.56}\text{Fe}_{0.48}\text{Zn}_{0.03})_{\Sigma 1.84}\text{Te}_{1.06}^{6+}\text{O}_{6.02} \cdot 5.98\text{H}_2\text{O}$; H_2O was determined by crystal-structure analysis and was confirmed by infrared spectroscopy. The mineral typically occurs as isolated, hexagonal-shaped thin plates or foliated masses in druses in quartz. Individual crystals average <0.1 mm across and are euhedral to subhedral, showing $\{001\}$, $\{100\}$, and $\{110\}$. Pale yellow to pale orange-yellow color, pale yellow streak, vitreous luster, transparent, brittle to slightly flexible, nonfluorescent, $H = 3\text{--}4$, perfect $\{001\}$ cleavage, $D_{\text{calc}} = 3.41 \text{ g/cm}^3$ for $Z = 1$. Optically uniaxial negative, $\epsilon_{\text{calc}} = 1.581$, $\omega = 1.803$. Single-crystal X-ray structure study indicated hexagonal symmetry, space group $P3$, $a = 5.305(1)$, $c = 9.693(6)$ Å as refined from a 114 mm Debye-Scherrer pattern with strongest lines of 9.70 (100,001), 4.834(80,002), 4.604(60,100), 2.655(60,110), 2.556(70,111), and 2.326(70,112).

The mineral is associated with jensenite, cesbronite, and hematite in quartzose dump material at the Centennial Eureka mine, which was worked mainly from 1876 to 1927. The formation of leisingite and a secondary Cu- and Te-bearing assemblage occurred prior to mining. The new name is for geologist J.F. Leising of Reno, Nevada, who helped to collect the discovery specimens. Type material is in the Systematic Reference Series of the National Mineral Collection, housed at the Geological Survey of Canada, Ottawa. **J.L.J.**

Penobsquisite*

J.D. Grice, R.A. Gault, J. Van Velthuisen (1996) Penobsquisite: A new borate mineral with a complex framework structure. *Can. Mineral.*, 34, 657–665.

Electron microprobe analysis gave CaO 17.27, FeO 7.48, MgO 1.82, MnO 0.23, Cl 5.77, B_2O_3 48.50, and H_2O 19.50 on the basis of stoichiometry and crystal-structure analysis, $\text{O} \equiv \text{Cl}$ 1.30, sum 99.29 wt%, corresponding to $\text{Ca}_{1.99}(\text{Fe}_{0.67}\text{Mg}_{0.29}\text{Mn}_{0.02})_{\Sigma 0.98}\text{Cl}_{1.05}[\text{B}_9\text{O}_{12.95}(\text{OH})_{5.99}] \cdot 4.01\text{H}_2\text{O}$, ideally $\text{Ca}_2\text{FeCl}[\text{B}_9\text{O}_{13}(\text{OH})_6] \cdot 4\text{H}_2\text{O}$. Occurs as pale yellow, triangular, euhedral, untwinned crystals, up to 1.5 mm wide, equidimensional to tabular on $\{100\}$, and with less prominent $\{101\}$, $\{10\bar{1}\}$, $\{111\}$, $\{110\}$, $\{1\bar{1}0\}$, $\{2\bar{1}2\}$, and $\{1\bar{1}2\}$. Transparent to translucent, vitreous luster, white streak, $H = 3$, brittle, conchoidal fracture, no cleavage, nonfluorescent, insoluble in water, $D_{\text{meas}} = 2.26$, $D_{\text{calc}} = 2.27 \text{ g/cm}^3$ for $Z = 2$. The infrared spectrum indicates the presence of H_2O groups and complex borate groups. Optically biaxial positive, $\alpha = 1.550(2)$, $\beta = 1.554(2)$, $\gamma = 1.592(2)$, $2V_{\text{meas}} = 33(2)$, $2V_{\text{calc}} = 36.6^\circ$, $Y = b$, $Z \wedge c = 16.6^\circ$ in obtuse angle β . Single-crystal X-ray structure study ($R = 0.022$) indicated monoclinic symmetry, space group $P2_1$, $a = 11.63(4)$, $b = 9.38(1)$, $c = 8.735(9)$ Å, $\beta = 98.40(7)^\circ$ as refined from a 114 mm Debye-Scherrer powder pattern ($\text{CuK}\alpha$ radiation) with strongest lines of 8.65(30,001), 7.29(100,110), 5.32(20,111), 4.50(20,211), 2.958(30,320,312,031), 2.744(20,013,203), and 2.113(30,114).

The mineral occurs with halite, boracite, hilgardite, pringleite, trembathite, sellaite, fluorite, and other minerals in a drill core from evaporites in the Mississippian Windsor Group at the Potash Corporation of Saskatchewan mine at Penobsquis, Kings County, New Brunswick. The new name is for the locality. Type material is in the Canadian Museum of Nature, Ottawa. **J.L.J.**

Rosiaite*

R. Basso, G. Lucchetti, L. Zefiro, A. Palenzona (1996) Rosiaite, PbSb_2O_6 , a new mineral from the Cetine mine, Siena, Italy. *Eur. J. Mineral.*, 8, 487–492.

Electron microprobe analysis gave PbO 40.88, Sb_2O_5 58.67, sum 99.55 wt%, corresponding to $\text{Pb}_{1.008}\text{Sb}_{1.997}\text{O}_6$. The mineral occurs as aggregates, up to 2 mm in size, in which individual crystals are thin, tabular, hexagonal in outline, and up to 0.3 mm across. The dominant form is $\{0001\}$, with subordinate $\{10\bar{1}1\}$ and $\{10\bar{1}0\}$. Crystals are pale yellow to colorless, transparent, resinous luster, brittle, white streak, possible $\{0001\}$ parting, conchoidal fracture, H not determinable, nonfluorescent, $D_{\text{calc}} = 6.96 \text{ g/cm}^3$ for $Z = 1$. Optically uniaxial negative, $\omega = 2.092(2)$, $\epsilon = 1.920(10)$, nonpleochroic. Single-crystal X-ray structure study ($R = 0.033$) indicated trigonal symmetry, space group $P\bar{3}1m$, $a = 5.301(1)$, $c = 5.375(1)$ Å as refined from a Guinier pattern ($\text{CuK}\alpha$ radiation) with strongest lines of 3.49(VS,101), 2.648(W,110), 2.110(W,201), 1.887(W,112), 1.651(W,211), and 1.531(W,300).

The mineral is associated with valentinite, tripuhyite, bindheimite, and Sb_2O_4 in cavities in waste rock at the Cetine de Cotorniano mine in central Tuscany, Italy, which produced antimony until 1948. The new name is after the village of Rosia, which is near the mine, and after the mine's former name. Type material is in the Dipartimento di Scienze della Terra, Università di Genova, Italy. **J.L.J.**

Ytthroapatite

E.Ya. Marchenko, L.K. Pozharitskaya, G.N. Nechelyustov, S.N. Strekozov (1995) Typochemical features of yttrium-containing rare earth phosphates of Priazovya (Ukrainian shield). *Mineral. Zhurnal*, 17(6), 3–13 (in Russian, English abs.).

Five electron microprobe analyses, ascribed to ytthroapatite, gave Y_2O_3 contents ranging from 3.70 to 7.90 wt% and SiO_2 contents from 3.30 to 7.30 wt%.

Discussion. Presumably "ytthroapatite" would designate a mineral with $\text{Y} > \text{Ca}$, which is not the case here. The name "ytthrobritholite" is also used, but neither name has been approved. **J.L.J.**

Pt(Ni,Fe)₃

M. Tarkian, M. Economou-Eliopoulos, G. Sambanis (1996) Platinum-group minerals in chromitites from the Pindos ophiolite complex, Greece. *Neues Jahrb. Mineral. Mon.*, 145–160.

One of four similar electron microprobe analyses gave Pt 53.35, Fe 13.29, Ni 30.35, Cu 2.72, As 0.01, sum 99.73 wt%, corresponding to $\text{Pt}_{1.02}(\text{Ni}_{1.93}\text{Fe}_{0.89}\text{Cu}_{0.16})_{\Sigma 2.98}$, ideally $\text{Pt}(\text{Ni,Fe})_3$ or PtNi_2Fe . The mineral occurs as grains, up to $10 \times 40 \mu\text{m}$, in cracks or along the boundaries of chromite grains. Yellowish in reflected light, isotropic; reflectance percentages are 55.8 (470 nm), 59.5 (546), 63.0 (589), and 64.9 (650).

Discussion. $\text{Pt}(\text{Ni,Cu,Fe})_3$ has been reported to occur in chromitites in Siberia (*Am. Mineral.*, 74, p. 1217, 1989). **J.L.J.**

Pd₈(As,Sb,Te)₃

Th. Weiser, H. Barth (1996) An unnamed platinum-group mineral from the Iluma Hill mine, Tanzania. *Mineral. Mag.*, 60, 672–673.

Two electron microprobe analyses gave Pd 74.10, 74.70, Ir 0.10, 0.17, As 10.20, 10.20, Sb 13.66, 13.37, Te 1.77, 1.68, sum 99.83, 100.12 wt%, corresponding to $(\text{Pd}_{7.99}\text{Ir}_{0.01})_{\Sigma 8.00}(\text{As}_{1.56}\text{Sb}_{1.29}\text{Te}_{0.15})_{\Sigma 3.00}$ and $(\text{Pd}_{8.03}\text{Ir}_{0.01})_{\Sigma 8.04}(\text{As}_{1.56}\text{Sb}_{1.26}\text{Te}_{0.15})_{\Sigma 2.97}$. In reflected light, creamy with a brownish tinge; no bireflectance or anisotropy. The mineral occurs as a nearly triangular grain, about $25 \mu\text{m}$, within native gold at Iluma, 120 km west of Dodoma, central Tanzania. **J.L.J.**

Ag and Pb tellurides-sulfides

Yanhe Cui, Shaomei Qi (1996) A study of telluride minerals from the Detiangau gold deposit, Beijing. *Acta Petrolog. Mineralog.*, 15(1), 80–91 (in Chinese, English abs.).

The minerals occur in pyrite-gold-polymetallic sulfide quartz veins in shear zones. Associated tellurides are altaite, petzite, volynskite, hessite, tellurbismuth, stützite, sylvanite, and native tellurium. A representative electron microprobe analysis and the range for the thirteen analyses for mineral M_1 are Fe 0.06 (0.06–0.09), Cu 0.08 (0.8–0.21), Pb 1.98 (0.00–4.44), Ag 47.26 (35.71–58.14), Au 0.25 (0.00–2.93), S 20.99 (13.72–29.67), Te 28.67 (25.04–46.53), As 0.10 (0.00–0.10), Sb 0.00 (0.00–0.04), Bi 0.00 (0.00–1.10), sum 99.39 wt%, corresponding to $\text{Ag}(\text{S}_{1.48}\text{Te}_{0.52})$. For $\text{S} + \text{Te} = 2$, ranges are Ag 0.60–1.57, S 1.58–1.09, Te 0.42–0.91, which is generalized as $\text{AgS}_{1+x}\text{Te}_{1-x}$, with $x = 0.09$ –0.58. The mineral occurs as grains to $100 \mu\text{m}$ across, $\text{VHN}_{30} = 126$, gray with greenish tint in reflected light, strongly anisotropic. Reflection percentages are 30.8 (405 nm), 32.19 (436), 32.32 (480), 32.28 (526), 31.66 (546), 30.16 (589), 28.17 (644), and 27.45 (656).

A mineral designated M_2 occurs as anhedral, granular grains to $100 \mu\text{m}$. Creamy white to white with a rosy hue in reflected light, strongly anisotropic, gray to grayish brown pleochroism, reflectance and hardness about the same as galena. The two analyses listed have Pb 0.67, 1.28, Au 23.23, 32.34, Ag 13.58, 11.05, S 1.02, 1.42, Te 61.51, 53.93, sum 100.01, 100.02 wt%, corresponding to $\text{Ag}_{0.98}\text{Au}_{0.92}(\text{Te}_{3.75}\text{S}_{0.25})_{\Sigma 4.00}$ and $\text{Au}_{1.42}\text{Ag}_{0.88}(\text{Te}_{3.66}\text{S}_{0.34})_{\Sigma 4.00}$.

Mineral M_3 occurs as anhedral, granular grains up to $50 \mu\text{m}$. Greyish white, weakly anisotropic in reflected light. Reflectance and hardness close to those of galena. Analysis gave Pb 47.80, Ag 22.91, S 14.86, Te 14.43, sum 100.00 wt%, corresponding to $\text{Pb}_{0.80}\text{Ag}_{0.74}\text{S}_{1.61}\text{Te}_{0.39}$, generalized as $(\text{Ag,Pb})(\text{S}_{1+x}\text{Te}_{1-x})$.

Mineral M_4 is creamy white, strongly anisotropic, with a reflectance slightly lower than that of galena. Analysis gave Pb 59.52, S 10.71, Te 29.76, sum 99.99 wt%, corresponding to $\text{Pb}(\text{S}_{1.18}\text{Te}_{0.82})$, generalized as $\text{Pb}(\text{S}_{1+x}\text{Te}_{1-x})$.

Discussion. X-ray data are needed to demonstrate the uniqueness of the minerals. **J.L.J.**

(Cr,V,Fe)₂(Ti,V,Nb)O₅

R.G. Platt, R.H. Mitchell (1996) Transition metal rutiles and titanates from the Deadhorse Creek diatreme complex, northwestern Ontario, Canada. *Mineral. Mag.*, 60, 403–413.

Electron microprobe analyses, normalized to 100 wt%, gave TiO_2 26.29–33.88, Nb_2O_5 3.67–10.21, Cr_2O_3 19.88–25.43, V_2O_5 23.17–29.80, Sc_2O_3 0.64–1.02, Al_2O_3 0.21–0.59, FeO 10.96–12.30, SrO 0.33–1.04, PbO 0.29–1.01, CaO 0.20–0.23, corresponding to the general formula $(\text{Cr,V}^{3+},\text{Fe}^{2+})_2(\text{Ti,V}^{4+},\text{Nb})\text{O}_5$, with the assumed valencies. The mineral is present as widely disseminated grains,

generally $<50\ \mu\text{m}$, in a complex assemblage that includes phenakite, zircon, uraninite, thorite, rutile, and members of the crichtonite group, which occur in a diatreme complex thought to represent the altered and brecciated top of an unexposed carbonatite intrusion. The occurrence is near Marathon, northwestern Ontario. **J.L.J.**

Na-Ca zeolite

B.M. England (1996) Zeolites and associated minerals from Borambil, New South Wales, Australia. *Austral. J. Mineral.*, 2(1), 11–20.

The ranges for five energy-dispersion analyses listed are SiO_2 44.0–53.1, Al_2O_3 23.0–28.1, CaO 8.3–8.9, Na_2O 4.4–7.7, sum 80.0–97.3 wt%, giving a constant $\text{Si}:(\text{Si} + \text{Al}) = 0.62$ and $\text{Si}/\text{Al} = 1.61\text{--}1.63$. The mineral occurs as flexible, ribbon-like filaments up to $10\ \mu\text{m}$ wide and commonly $>1\ \text{cm}$ long, randomly draped over thomsonite and chabazite in vesicles in a Tertiary basalt. Major X-ray peaks are present at 6.672 and 2.206 Å. **J.L.J.**

New Data

Blatterite

J.-O. Bovin, A. Carlsson, R. Sjövall, R. Thomasson, R. Norrestam, I. Sjøtofte (1996) The crystal structure of a blatterite mineral, $\text{Mg}_{1.33}\text{Mn}_{1.44}\text{Fe}_{0.05}\text{Sb}_{0.17}\text{O}_2\text{BO}_3$, a combined single crystal X-ray and HREM study. *Zeits. Kristallogr.*, 211, 440–448.

Single-crystal X-ray structure study ($R = 0.056$) of blatterite from the Mossgruvan mine, Nordmark, Sweden, indicated the structural formula to be $\text{Mn}_{1.253}^{2+}\text{Mg}_{1.246}\text{Mn}_{0.313}^{3+}\text{Sb}_{0.188}^{5+}\text{O}_2\text{BO}_3$. The mineral is orthorhombic, as was known previously, but the former space group alternatives have been narrowed to *Pbnm*. **J.L.J.**

Isocubanite

N.N. Mosgova, S.N. Nenaseva, Yu.S. Borodayev, A.J. Tsepin (1996) Compositional range and isomorphism of isocubanite. *Geochem. Internat.*, 33(1), 1–21.

Isocubanite is the cubic, high-temperature form of cubanite and is assigned the formula CuFe_2S_3 . Numerous electron microprobe analyses of oceanic isocubanite have shown that Cu content ranges from 19.0 to 34.0 wt%, and Fe varies from 31.2 to 35.8 wt%. For $S = 3$, the known composition range corresponds to $\text{Cu}_{1-y+x}\text{Zn}_x\text{Fe}_{2+y}\text{S}_3$, where $0 \leq x \leq 0.06$, and $0.56 \leq y \leq 0.20$. **J.L.J.**

Keyite

M.A. Cooper, F.C. Hawthorne (1996) The crystal structure of keyite, $\text{Cu}_3^+(\text{Zn,Cu}^{2+})_4\text{Cd}_2(\text{AsO}_4)_6(\text{H}_2\text{O})_2$, an oxysalt mineral with essential cadmium. *Can. Mineral.*, 34, 623–630.

Single-crystal X-ray structure study ($R = 0.093$) of keyite from Tsumeb, Namibia (type locality), gave monoclinic symmetry, space group *I2/a*, $a = 11.654(3)$, $b = 12.780(5)$, $c = 6.840(3)$ Å, $\beta = 99.11(3)^\circ$, formula as above, $D_{\text{calc}} = 5.106\ \text{g/cm}^3$ for $Z = 2$.

Discussion. The formula, space group, and cell contents are new. The proposed redefinition has not been submitted to the CNMMN for approval. **J.L.J.**

Shomiokite-(Y)

J.D. Grice (1996) The crystal structure of shomiokite-(Y). *Can. Mineral.*, 34, 649–655.

Single-crystal X-ray structure study ($R = 0.053$) of shomiokite-(Y) from the Poudrette quarry, Mont Saint-Hilaire, Quebec, gave unit-cell data and a chemical formula in good agreement with those in the original description (*Am. Mineral.*, 79, 765–766, 1994) and also showed that the space group is *Pbnm*. **J.L.J.**