

## NEW MINERAL NAMES\*

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### Arakiite\*

A.C. Roberts, M.A. Cooper, F.C. Hawthorne, J.D. Grice, M.N. Feinglos (2000) Arakiite, a new Zn-bearing hematolite-like mineral from Långban, Sweden. *Mineral. Record*, 31, 253–256.

M.A. Cooper, F.C. Hawthorne (1999) The effect of differences in coordination on ordering of polyvalent cations in close-packed structures: the crystal structure of arakiite and comparison with hematolite. *Can. Mineral.*, 37, 1471–1482.

Electron microprobe analysis gave MgO 12.76, MnO 34.32, ZnO 4.48, As<sub>2</sub>O<sub>3</sub> 6.56 (partitioned for 1 As<sup>3+</sup> per formula unit), As<sub>2</sub>O<sub>5</sub> 15.84, Al<sub>2</sub>O<sub>3</sub> 2.25, Fe<sub>2</sub>O<sub>3</sub> 6.76, H<sub>2</sub>O (calc.) 13.74, sum 96.71 wt%, which for O = 34 corresponds to (Zn<sub>0.83</sub>Mn<sub>0.17</sub>)<sub>Σ1.00</sub>(Mn<sub>7.12</sub>Mg<sub>4.77</sub>)<sub>Σ11.89</sub>(Fe<sub>1.28</sub>Al<sub>0.67</sub>)<sub>Σ1.95</sub>(As<sup>3+</sup>O<sub>3</sub>)(As<sup>5+</sup>O<sub>4</sub>)<sub>2.08</sub>(OH)<sub>22.68</sub>, simplified as (Zn,Mn<sup>2+</sup>)(Mn<sup>2+</sup>,Mg)<sub>12</sub>(Fe,Al)<sub>2</sub>(As<sup>3+</sup>O<sub>3</sub>)(As<sup>5+</sup>O<sub>4</sub>)<sub>2</sub>(OH)<sub>23</sub>. The mineral occurs as aggregates of micaceous, anhedral, red-brown to orange-brown plates that have an area of 10 × 15 mm. Opaque in masses, translucent at thin edges, resinous to submetallic luster, pale brown streak, brittle, uneven fracture, perfect {001} cleavage, *H*<sub>est</sub> = 3–4, nonfluorescent, *D*<sub>calc</sub> = 3.41 g/cm<sup>3</sup> for the empirical formula and *Z* = 4. Optically biaxial negative, α = 1.723(4), β = 1.744(2), γ = 1.750(2), 2*V*<sub>meas</sub> = 40–44, 2*V*<sub>calc</sub> = 56°, medium dispersion *r* > *v*, *Y* = *b*, *X*∧*c* = 4° in β obtuse, nonpleochroic. Single-crystal X-ray structure study (*R* = 0.056) indicated monoclinic symmetry, space group *Cc*, *a* = 14.236(2), *b* = 8.206(1), *c* = 24.225(4) Å, β = 93.52(1)°. Strongest lines of the powder pattern (114 mm Debye–Scherrer, CuKα radiation) are 12.07(100,002), 6.046(100,004), 4.119(30,020), 3.148(30,404,117), 3.030(70,224), and 2.411(40,424,515). The crystal structure has five distinct polyhedral layers along the *c* axis; four of the layers are topologically identical to those in hematolite, but the fifth differs.

The mineral is associated mainly with fine-grained specular hematite, and is part of a larger specimen housed at the Natural History Museum, London, UK. The holotype is in the Harvard Mineralogical Museum, Cambridge, Massachusetts. The new name is for crystallographer Takaharu Araki (b. 1929), formerly of the University of Chicago. **J.L.J.**

### Chromceladonite\*

I.V. Pekov, N.V. Chukanov, E.V. Rumianstseva, Yu.K. Kabalov, Yu. Schneider, N.V. Ledeneva (2000) Chromceladonite KCrMg[Si<sub>4</sub>O<sub>10</sub>](OH)<sub>2</sub> — a new mineral of the mica group. *Zapiski Vseross. Mineral. Obshch.*, 129(1), 38–44 (in Russian, English abs.).

The mineral occurs as rock-forming aggregates of laminae, to 1 cm, and as spherulites and veinlets. Electron microprobe and wet-chemical analyses gave K<sub>2</sub>O 10.42, Na<sub>2</sub>O 0.14, Li<sub>2</sub>O 0.13, MgO 7.82, MnO 0.19, ZnO 0.22, FeO 0.73, Fe<sub>2</sub>O<sub>3</sub> 0.58, V<sub>2</sub>O<sub>5</sub> 1.79, Cr<sub>2</sub>O<sub>3</sub> 17.01, Al<sub>2</sub>O<sub>3</sub> 3.25, TiO<sub>2</sub> 0.16, SiO<sub>2</sub> 53.20, H<sub>2</sub>O<sup>+</sup> 3.38, F 0.57, O ≡ F 0.24, sum 99.35 wt%, corresponding to (K<sub>0.94</sub>Na<sub>0.02</sub>)<sub>Σ0.96</sub>(Cr<sub>0.95</sub>V<sub>0.10</sub>Al<sub>0.05</sub>Fe<sub>0.03</sub>Ti<sub>0.01</sub>)<sub>Σ1.14</sub>(Mg<sub>0.83</sub>Fe<sub>0.04</sub>Li<sub>0.04</sub>Zn<sub>0.01</sub>Mn<sub>0.01</sub>)<sub>Σ0.93</sub>[(Si<sub>3.78</sub>Al<sub>0.22</sub>)<sub>Σ4.00</sub>O<sub>10</sub>][(OH)<sub>1.60</sub>F<sub>0.13</sub>O<sub>0.13</sub>]<sub>Σ1.86</sub>, ideally KCrMg[Si<sub>4</sub>O<sub>10</sub>](OH)<sub>2</sub>. Green color, pale green streak, vitreous to silky luster, *H* = 1–2, perfect {001} cleavage, flexible, *D*<sub>meas</sub> = 2.90, *D*<sub>calc</sub> = 2.95 g/cm<sup>3</sup> for *Z* = 2. The IR spectrum is similar to that of ferroccladonite. Optically biaxial negative, α = 1.605(1), β = 1.648(1), γ = 1.654(1), 2*V*<sub>meas</sub> = 12(10)°, *a*∧*c* < 5°; pleochroic, with *X* = pale green to colorless, *Y*, *Z* = green. The X-ray powder pattern (diffractometer, MoKα radiation) has strongest lines at 4.54(93,020), 3.638(64,112), 3.097(51,112), 2.588(100,131), 2.409(87,132), and 1.518 Å (58,331). Rietveld refinement (*R* = 0.054) indicated monoclinic symmetry, space group *C2*, 1*M* polytype, *a* = 5.267(1), *b* = 9.101(2), *c* = 10.162(3) Å, β = 100.67(2)°.

The mineral, which is the Cr analog of celadonite, is metasomatic-hydrothermal and is associated with dolomite, quartz, roscoelite, chromphyllite, calcite, hematite, uraninite, and other minerals at the Padma uranium-vanadium deposit, southern Karelia, Russia. Other occurrences of apparently the same mineral are known (e.g., *Am. Mineral.*, 70, p. 219, 1985). Type material is in the Fersman Mineralogical Museum, Moscow, Russia. **J.L.J.**

### Juanitaite\*

A.R. Kampf, W.S. Wise, G.R. Rossman (2000) Juanitaite, a new mineral from Gold Hill, Utah. *Mineral. Record*, 31, 301–305.

The mineral occurs at the Gold Hill mine, western Tooele County, Utah, as square olive-green and grass-green plates, 1 μm thick and to 150 μm across, in sheaf-like subparallel aggregates and rosettes. The crystals are platy on {001} and are

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

bounded by {110}, with modification of the resulting square by {310} to give 'rounded' corners. Resinous to dull luster, translucent, pale greenish yellow streak,  $H = \sim 1$ , flexible, no fracture observed, nonfluorescent, perfect {001} and {110} cleavages, good on {100};  $D_{\text{meas}} = 3.61(5)$ ,  $D_{\text{calc}} = 3.56 \text{ g/cm}^3$  for  $Z = 4$ . Uniaxial negative,  $\omega = 1.785(5)$ ,  $\epsilon = 1.705(5)$ ,  $O =$  olive brown,  $E =$  olive green; subparallel aggregates are biaxial,  $2V = \sim 20^\circ$ . Electron microprobe analysis gave CaO 8.64, FeO 2.32, CuO 35.97,  $\text{Bi}_2\text{O}_3$  14.82,  $\text{As}_2\text{O}_5$  29.35,  $\text{H}_2\text{O}$  by difference 8.90, sum 100 wt%, corresponding to  $(\text{Cu}_{7.03}\text{Ca}_{2.39}\text{Fe}_{0.50})_{\Sigma 9.92}\text{Bi}_{0.99}(\text{AsO}_4)_{3.97}(\text{OH})_{10.90} \cdot 2.22\text{H}_2\text{O}$ , ideally  $(\text{Cu,Ca,Fe})_{10}\text{Bi}(\text{AsO}_4)_4(\text{OH})_{11} \cdot 2\text{H}_2\text{O}$ . Bands at 3440 and  $1600 \text{ cm}^{-1}$  in the infrared spectrum confirm the presence of  $\text{H}_2\text{O}$ . Single-crystal X-ray study indicated tetragonal symmetry, space group  $P4_2/nmm$ ;  $a = 9.961(3)$ ,  $c = 29.19(2) \text{ \AA}$  as refined from a Debye-Scherrer powder pattern (114 mm,  $\text{CuK}\alpha$  radiation) with strongest lines of 14.6(100,002), 7.04(50,110), 6.34(70,112), 5.07(50,114), 3.146(60,310,303), and 2.535(50,228).

The mineral formed by oxidation of tennantite, chalcopyrite, and pyrite, and is associated with mixite, conichalcite, connellite, tyrolite, azurite, gold, and quartz. The new name is for Juanita Curtis, mineral collector, who found the mineral. Type material is in the Los Angeles County Museum of Natural History, California. **J.L.J.**

#### Litvinskite\*

I.V. Pekov, I.A. Ekimenkova, N.V. Chukanov, A.E. Zadov, N.A. Yamnova, Yu.K. Egorov-Tismenko (2000) Litvinskite  $\text{Na}_2(\square, \text{Na}, \text{Mn})\text{Zr}[\text{Si}_6\text{O}_{12}(\text{OH}, \text{O})_6]$  — a new mineral of the lovozerite group. Zapiski Vseross. Mineral. Obshch., 129(1), 45–53 (in Russian, English abs.).

Electron microprobe analysis, with Na by atomic absorption and  $\text{H}_2\text{O}$  by the Penfield method, gave  $\text{Na}_2\text{O}$  12.43,  $\text{K}_2\text{O}$  0.11, CaO 0.13, MnO 1.61, FeO 0.09,  $\text{Ce}_2\text{O}_3$  0.09,  $\text{SiO}_2$  57.67,  $\text{TiO}_2$  0.19,  $\text{ZrO}_2$  18.85,  $\text{HfO}_2$  0.22,  $\text{Nb}_2\text{O}_5$  0.07,  $\text{H}_2\text{O}$  8.90, sum 100.36 wt%, corresponding to  $\text{Na}_{2.51}\text{K}_{0.01}\text{Mn}_{0.14}\text{Ca}_{0.01}\text{Fe}_{0.01}\text{Zr}_{0.96}\text{Ti}_{0.01}\text{Hf}_{0.01}\text{Si}_{6.00}\text{O}_{12.76}(\text{OH})_{5.24} \cdot 0.47\text{H}_2\text{O}$ ; the structural formula is  $(\text{Na}_{1.54}\text{K}_{0.01}(\text{H}_2\text{O})_{0.47}\text{Na}_{0.78}(\text{Na}_{0.19}\text{Mn}_{0.14}\text{Ca}_{0.01}\text{Fe}_{0.01})_{\Sigma 2.51}\text{Zr}_{0.96}\text{Ti}_{0.01}\text{Hf}_{0.01})[\text{Si}_6\text{O}_{12}(\text{OH})_3\{(\text{OH})_{2.24}\text{O}_{0.76}\}]$ , idealized as  $(\text{Na}, \text{H}_2\text{O}, \square)_3(\square, \text{Na}, \text{Mn})\text{Zr}[\text{Si}_6\text{O}_{12}(\text{OH})_3(\text{OH}, \text{O})_3]$ , and simplified as  $\text{Na}_2(\square, \text{Na}, \text{Mn})\text{Zr}[\text{Si}_6\text{O}_{12}(\text{OH}, \text{O})_6]$ . The mineral occurs as dark cherry-red to reddish brown equant grains to 7  $\mu\text{m}$ , and as aggregates to 15  $\mu\text{m}$ . Vitreous luster, transparent, white streak, imperfect {110} cleavage, conchoidal fracture,  $H = \sim 5$ ,  $D_{\text{meas}} = 2.61$ ,  $D_{\text{calc}} = 2.63 \text{ g/cm}^3$  for  $Z = 2$ . Optically biaxial negative,  $\alpha = 1.546(1)$ ,  $\beta = 1.574(1)$ ,  $\gamma = 1.575(1)$ ,  $2V_{\text{meas}} = < 10^\circ$ , nonpleochroic. The IR spectrum is similar to that of lovozerite. Single-crystal X-ray structure study ( $R = 0.0649$ ) indicated monoclinic symmetry, space group  $Cm$ ,  $a = 10.589(7)$ ,  $b = 10.21(8)$ ,  $c = 7.355(5) \text{ \AA}$ ,  $\beta = 92.91(5)^\circ$ . Strongest lines of the powder pattern (diffractometer,  $\text{CoK}\alpha$  radiation) are 7.37(44, 110,001), 5.29(100,11 $\bar{1}$ ,200), 3.329(74,22 $\bar{1}$ ,112,310), 3.238(100,130,221,112), 2.981(39,13 $\bar{1}$ ,022,311), and 2.553(37,040,222).

The mineral, which is in the lovozerite group, is associated with aegirine, microcline, nepheline, sodalite, eudialyte, lomonosovite, ussingite, and mangan-neptunite, and is replaced by terskite and gaidonnayite. The assemblage occurs in a

hyperagpaitic pegmatite at Mount Alluaiv, Lovozero alkaline massif, Kola Peninsula, Russia. The new mineral name is for former crystallographer Galina P. Litvinskaya (1920–1994) of Moscow State University. Type material is in the Fersman Mineralogical Museum, Moscow, Russia.

**Discussion.** Total formula Na alone sums to 2.51, which is difficult to reconcile with the simplified formula. **J.L.J.**

#### Remondite-(La)\*

I.V. Pekov, N.V. Chukanov, N.N. Kononkova, A.E. Zadov, Yu.V. Belovitskaya (2000) Remondite-(La),  $\text{Na}_3(\text{La}, \text{Ce}, \text{Ca})_3(\text{CO}_3)_5$  — a new mineral of the burbankite family from the Khibiny massif, Kola Peninsula. Zapiski Vseross. Mineral. Obshch., 129(1), 53–60 (in Russian, English abs.).

The mineral occurs as bright orange-yellow, rough-prismatic segregations up to  $0.5 \times 0.8 \times 2 \text{ mm}$ , consisting of irregular grains which are  $\leq 5 \mu\text{m}$ . Translucent, vitreous luster, brittle, white streak, no cleavage, conchoidal fracture,  $H = \sim 3$ ,  $D_{\text{meas}} = 3.5(1)$ ,  $D_{\text{calc}} = 3.57 \text{ g/cm}^3$  for  $Z = 2$ . Optically biaxial negative,  $\alpha = 1.615(2)$ ,  $\beta = 1.619(3)$ ,  $\gamma = 1.622(3)$ ,  $2V_{\text{meas}} = 80(10)$ ,  $2V_{\text{calc}} = 85(5)^\circ$ , colorless, nonpleochroic. Electron microprobe analysis gave  $\text{Na}_2\text{O}$  15.48,  $\text{K}_2\text{O}$  0.58, CaO 5.13, SrO 2.93, BaO 0.18,  $\text{La}_2\text{O}_3$  19.75,  $\text{Ce}_2\text{O}_3$  16.67,  $\text{Pr}_2\text{O}_3$  0.99,  $\text{Nd}_2\text{O}_3$  2.27,  $\text{Sm}_2\text{O}_3$  0.37,  $\text{ThO}_2$  1.34,  $\text{CO}_2$  (calc) 32.97, sum 98.66 wt%, corresponding to  $\text{Na}_{2.87}(\text{La}_{0.805}\text{Ce}_{0.68}\text{Ca}_{0.61}\text{Na}_{0.465}\text{Sr}_{0.18}\text{Nd}_{0.09}\text{K}_{0.08}\text{Pr}_{0.04}\text{Th}_{0.03}\text{Sm}_{0.01}\text{Ba}_{0.01})_{\Sigma 3.00}(\text{CO}_3)_5$ , ideally  $\text{Na}_3(\text{La}, \text{Ce}, \text{Ca})_3(\text{CO}_3)_5$ . The IR spectrum and X-ray powder pattern are similar to those of remondite-(Ce). Indexing of the powder pattern (57 mm Debye-Scherrer) gave monoclinic symmetry, probable space group  $P2$ ,  $a = 10.49(1)$ ,  $b = 6.417(4)$ ,  $c = 10.50(1) \text{ \AA}$ ,  $\beta = 119.8(1)^\circ$ . Strongest lines are 3.70(70,012), 3.036(90,112,211,31 $\bar{1}$ ), 2.623(100, 204,022,402,220), 2.143(80,014,410), 2.041(60,222), and 1.939(60,032,230).

The mineral, which is the La analog of remondite-(Ce), is late-stage hydrothermal in a small, hyperagpaitic pegmatite at Mount Koashva, Khibiny alkaline massif, Kola Peninsula, Russia. Among the associated minerals are aegirine, cancrisilite, sodalite, microcline, villiaumite, natrolite, pectolite, lomonosovite, barytolamprophyllite, natron, thermonatrite, and catapleite. Type material is in the Fersman Mineralogical Museum, Moscow, Russia. **J.L.J.**

#### PtCu<sub>1-x</sub>Sb<sub>x</sub>

A.V. Okrugin, N.V. Zayakina, N.V. Leskova, I.P. Laputina, D.K. Scherbachev (1999). Phase composition of Pt-Cu-Sb alloys from platinum-bearing placer deposits of western Yakutia. Zapiski Vseross. Mineral. Obsch., 128(5), 79–84 (in Russian, English abs.).

The mineral occurs as well-rounded grains that are  $< 0.2 \text{ mm}$  and are associated with hongshiite and ferroan platinum in Au-Pt-bearing placer deposits of the Chybyda River (a tributary of the Vilyui River) and the Chara River (a tributary of the Lena River), in eastern Siberia, Russia. Electron microprobe analyses of six grains of the mineral from Chybyda, and of three from Chara, gave averages and ranges of Pt 68.75 (67.82–71.23), Rh 0.16 (0.00–0.38), Pd 2.16 (1.80–2.49), Fe 0.14 (0.13–

0.17), Cu 18.68 (18.28–19.55), Sb 8.49 (7.80–9.08), As 0.43 (0.06–0.85), sum 98.81 (98.02–100.04) wt%, and Pt 69.43 (69.10–69.96), Rh 0.32 (0.24–0.44), Pd 0.96 (0.94–0.99), Fe 2.13 (1.65–2.51), Cu 18.16 (17.81–18.56), Sb 7.08 (6.83–7.48), As 0.41 (0.11–0.61), sum 98.50 (98.15–99.05) wt%, corresponding to  $\text{PtCu}_{0.8}\text{Sb}_{0.2}$  and  $\text{PtCu}_{0.83}\text{Sb}_{0.17}$ , respectively. The suggested formula is  $\text{PtCu}_{1-x}\text{Sb}_x$ , wherein  $0.15 < x < 0.25$ . Grayish white color, opaque, brittle,  $VHN_{5-10} = 359-567$  for grains from Chybyda, and  $550-567$  for grains from Chara. White with a yellowish tint in reflected light, weakly anisotropic. Reflectance percentages (standard not stated) are given in 20 nm steps from 440–700 nm; representative  $R_1$  and  $R_2$  values are 56.7, 52.2 (480), 57.8, 52.8 (540), 60.0, 55.9 (580), 60.1, 57.1 (600), and 59.3, 58.8 (660). Diffraction lines given for the X-ray powder pattern (57 mm Gandolfi camera,  $\text{FeK}\alpha$  radiation) are 2.230(100), 2.026(15), 1.710(5), 1.412(40), 1.262(20), 1.195(40), and 1.032 Å (10). On the basis of the mineralogical observations and the phase relations in the Pt-Cu-Sb system, a high-temperature limited solid solution of Pt, Cu, and Sb is interpreted to have yielded the  $\text{PtCu}_{1-x}\text{Sb}_x$  + hongshiite paragenesis by ordering at lower temperatures. **V.A.K.**

#### $\text{Ag}_5\text{CuBi}_4\text{Pb}(\text{S,Se})_{11}$

S.V. Biruk, L.Z. Skakun, O.I. Matkovskii (1998) Paragenesis of Bi-Pb-Cu-Ag sulfides and sulfosalts from the gold – polymetallic ores of the Beregovo ore field. *Mineral. Zhurnal*, 20(4), 14–25 (in Russian).

The Bi minerals occur as 0.001–0.35 mm grains in epithermal Au – base metal ores at the Beregovo and Muzievo deposits in the Beregovo ore field, Transcarpathia, Ukraine. The minerals are associated with galena, chalcopyrite, and fine-grained dense quartz, and replaced early-formed sulfide aggregates. Electron microprobe data indicate that the Bi-rich assemblage probably consists of bismuthinite, matildite,  $\text{PbS}_{33}$ , sulfosalts of the ourayite-mummeite and gustavite-lilianite series, *treasurite*(?), Ag-rich *soucekite*(?), Pb-rich *benjaminite*(?), *berryite*(?), *gladite-krupkaite*, and an unnamed mineral suggested to be  $\text{Ag}_5\text{CuBi}_4\text{Pb}(\text{S,Se})_{11}$ . Electron microprobe analysis of two grains of the unnamed mineral gave Ag 26.64, 26.86, Cu 3.70, 8.26, Pb 4.79, 9.36, Bi 45.17, 37.80, Se 0.92, 0.98, S 16.20, 16.61, Sb 0.00, 0.07, Au 0.35, 0.00, As 0.76, 0.00, Zn 0.00, 0.04, Fe 0.17, 0.18, sum 98.70, 100.10 wt%. Other properties are not given.

**Discussion.** For (S,Se) = 11, the two analyses correspond to  $\text{Ag}_{5.26}\text{Cu}_{1.24}\text{Fe}_{0.17}\text{Au}_{0.04}\text{Pb}_{0.49}\text{Bi}_{4.60}\text{As}_{0.22}(\text{S}_{10.75}\text{Se}_{0.25})$  and  $\text{Ag}_{5.16}\text{Cu}_{2.70}\text{Zn}_{0.13}\text{Fe}_{0.07}\text{Pb}_{0.94}\text{Bi}_{3.75}\text{Sb}_{0.01}(\text{S}_{10.74}\text{Se}_{0.26})$ , respectively. **V.A.K.**

#### $(\text{Tl,Ag})_2\text{Pb}_6(\text{As,Sb})_{16}\text{S}_{31}$

M. Shimizu, F. Matsuyama, M. Shimizu (1999) Hutchinsonite,  $\text{TlPb}(\text{As,Sb})_5\text{S}_9$ , *chabournéite*,  $\text{Tl}_2\text{Pb}(\text{Sb,As})_{10}\text{S}_{17}$ , and unnamed  $(\text{Tl,Ag})_2\text{Pb}_6(\text{As,Sb})_{16}\text{S}_{31}$  from the Toya-Takarada mine, Hokkaido, Japan — Tl mineralization in the Kuroko deposits. *Resource Geol. Spec. Issue*, 20, 31–37.

The mean of three listed electron microprobe analyses is Tl 6.51, Ag 2.10, Pb 31.34, As 22.36, Sb 12.86, S 25.11, sum

100.29 wt%, corresponding to  $(\text{Tl}_{1.26}\text{Ag}_{0.77})_{\Sigma 2.03}\text{Pb}_{5.99}(\text{As}_{11.82}\text{Sb}_{4.18})_{\Sigma 16.00}\text{S}_{30.99}$ , ideally  $(\text{Tl,Ag})_2\text{Pb}_6(\text{As,Sb})_{16}\text{S}_{31}$ . Creamy yellow in reflected light, more strongly pleochroic, anisotropic, and lighter color than hutchinsonite. The mineral occurs as anhedral grains in orpiment and hutchinsonite in altered tuff breccia within Kuroko massive sulfide ore. **J.L.J.**

#### Monoclinic $\text{SiO}_2$

A. El Goresy, L. Dubrovinsky, T.G. Sharp, S.K. Saxena, Ming Chen (2000) A monoclinic post-stishovite polymorph of silica in the Shergotty meteorite. *Science*, 288, 1632–1634.

Wedge-shaped silica grains in Shergotty are 150–900  $\mu\text{m}$ , each consisting of mosaics of domains, 10–60  $\mu\text{m}$  in diameter, that display orthogonal sets of lamellae. An X-ray pattern of a silica grain gave 18 lines, 15 of which could be indexed on a monoclinic, baddelyite-like structure with  $a = 4.375(1)$ ,  $b = 4.584(1)$ ,  $c = 4.708(1)$  Å,  $\beta = 99.97(3)^\circ$ ,  $D_{\text{calc}} = 4.30(2)$  g/cm<sup>3</sup>. Strongest lines are 3.260(22,011), 2.767(100,11 $\bar{1}$ ), 2.459(31,111), 1.950(26,210), and 1.629(24,022). The three unindexed lines are interpreted as belonging to stishovite and the orthorhombic  $\alpha$ - $\text{PbO}_2$  polymorph of silica.

**Discussion.** The mineral differs from the synthetic high-pressure, monoclinic phase-II of cristobalite described by Dove et al. (*Mineral. Mag.*, 64, 569–576, 2000), which has  $a = 8.3780$ ,  $b = 4.6018$ ,  $c = 9.0568$  Å,  $\beta = 124.949^\circ$ , space group  $P2_1/c$ . **J.L.J.**

#### $\text{CaCe}_2(\text{SiO}_4)_2$

P.I. Karchevsky (2000) Minerals of Sr and REE in carbonatites from the Loolekop deposit (Phalaborwa, RSA). *Zapiski Vseross. Mineral. Obshch.*, 129(1), 99–109 (in Russian, English abs.).

The mineral occurs as isometric [equidimensional?] grains, to 75 × 120  $\mu\text{m}$ , in the early-formed, silicate-mineral portion of the phoscorite-carbonatite Loolekop complex in South Africa. One of 10 listed electron microprobe analyses has  $\text{SiO}_2$  22.0,  $\text{La}_2\text{O}_3$  9.9,  $\text{Ce}_2\text{O}_3$  29.2,  $\text{Pr}_2\text{O}_3$  4.7,  $\text{Nd}_2\text{O}_3$  16.9,  $\text{Sm}_2\text{O}_3$  3.0,  $\text{Gd}_2\text{O}_3$  1.6,  $\text{CaO}$  10.2,  $\text{P}_2\text{O}_5$  1.9, sum 99.4 wt%, corresponding to  $\text{Ca}_{0.92}\text{Ce}_{0.91}\text{Nd}_{0.51}\text{La}_{0.31}\text{Pr}_{0.14}\text{Sm}_{0.09}\text{Gd}_{0.04}\text{Si}_{22.00}(\text{Si}_{1.86}\text{P}_{0.14})_{\Sigma 22.00}\text{O}_8$ , ideally  $\text{CaCe}_2\text{Si}_2\text{O}_8$ .

**Discussion.** No X-ray data are given, but the mineral may be the Ce analog of synthetic hexagonal  $\text{Ca}_3\text{La}_6(\text{SiO}_4)_6$ , as in PDF 27–78. **J.L.J.**

#### $\text{KLi}_3\text{Zr}_2\text{Si}_2\text{O}_{30}$

L.A. Pautov, P.V. Khovorov, V.A. Muftakhov, A.A. Agakhanov (2000) Sogdianite and sugilite from Dara-i-Pioz massif (Tajikistan). *Zapiski Vseross. Mineral. Obshch.*, 129(3), 66–79 (in Russian, English abs.).

The mineral, which has a quartz and aegirine association in pegmatites at Dara-i-Pioz, occurs as tabular crystals, to 5 mm, showing {001} and {100}. The grains are pseudomorphs after eudialyte.  $H = 6.5$ ,  $D_{\text{meas}} = 2.78(2)$  g/cm<sup>3</sup>. Optically uniaxial positive,  $\omega = 1.578(2)$ ,  $\epsilon = 1.582(2)$ . One of eight listed electron microprobe analyses has  $\text{K}_2\text{O}$  4.47,  $\text{Na}_2\text{O}$  0.02,  $\text{Li}_2\text{O}$

(atomic absorption) 4.19, Fe<sub>2</sub>O<sub>3</sub> 0.03, ZrO<sub>2</sub> 23.28, HfO<sub>2</sub> 0.38, SiO<sub>2</sub> 66.75, sum 99.12 wt%, corresponding to K<sub>1.02</sub>Na<sub>0.01</sub>Li<sub>3.01</sub>Zr<sub>2.03</sub>Hf<sub>0.02</sub>Si<sub>11.94</sub>, ideally KLi<sub>3</sub>Zr<sub>2</sub>Si<sub>12</sub>O<sub>30</sub>. The X-ray powder pattern is similar to that of sugilite, and  $a = 10.325(2)$ ,  $c = 14.325(2)$  Å, hexagonal. Strongest lines (diffractometer, Fe radiation) are 7.16(35,002), 4.39(39,200), 4.13(100,112), 3.22(46,211), and 2.921(74,114). The mineral is a Na-poor, Zr-rich member (the Zr analog of berezanskite) in the osumilite group. **J.L.J.**

#### H<sub>3</sub>O-rich nenadkevichite-labunstovite

R.K. Rastsvetaeva, N.I. Organova, I.V. Rozhdestvenkaya, Z.v. Schlukova, N.V. Chukanov (2000) Crystal structure of an oxonium mineral of the nenadkevichite-labunstovite group from the Khibina massif. *Doklady Akad. Nauk*, 371(3), 336–340 (in Russian).

The empirical formula corresponds to (Na<sub>3.1</sub>K<sub>0.9</sub>Ca<sub>0.1</sub>Sr<sub>0.4</sub>Ba<sub>0.3</sub>Fe<sub>0.05</sub>)<sub>Σ4.85</sub>(H<sub>3</sub>O)<sub>2.5</sub>(Ti<sub>4.1</sub>Nb<sub>3.9</sub>)<sub>Σ8</sub>(Si<sub>4</sub>O<sub>12</sub>)<sub>4</sub>(O<sub>4</sub>OH<sub>4</sub>)·15H<sub>2</sub>O. Single-crystal X-ray structure study indicated monoclinic symmetry, space group *Cm*,  $a = 14.604(7)$ ,  $b = 14.274(8)$ ,  $c = 7.933(2)$  Å,  $\beta = 117.40(3)^\circ$ ,  $D_{\text{calc}} = 2.49$  g/cm<sup>3</sup> for  $Z = 1$ . The structural formula corresponds to (H<sub>3</sub>O)<sub>4</sub>Na<sub>2</sub>K[Sr<sub>0.4</sub>(H<sub>2</sub>O)<sub>0.8</sub>]{[(Ti<sub>4.5</sub>Nb<sub>3.5</sub>)(OH<sub>4.5</sub>O<sub>3.5</sub>)](Si<sub>4</sub>O<sub>12</sub>)<sub>4</sub>}·4.2H<sub>2</sub>O. The mineral occurs as colorless, transparent tabular crystals in a hydrothermally altered vein in the Khibina massif, Kola Peninsula, Russia. **J.L.J.**

## New Data

### Curite

Yaping Li, P.C. Burns (2000) Investigations of crystal-chemical variability in lead uranyl oxide hydrates. I. Curite. *Can. Mineral.*, 38, 727–735.

Single-crystal X-ray structure studies of 14 crystals from various localities in the Democratic Republic of Congo, and a synthetic crystal, gave orthorhombic symmetry, space group *Pnam*,  $a = 12.53$ – $12.58$ ,  $b = 13.01$ – $13.03$ ,  $c = 8.39$ – $8.40$  Å,  $R = 0.037$ – $0.079$ ,  $Z = 2$ . The structurally derived new formula is Pb<sub>3+x</sub>(H<sub>2</sub>O)<sub>2</sub>[(UO<sub>2</sub>)<sub>4</sub>O<sub>4+x</sub>(OH)<sub>3-x</sub>]<sub>2</sub>. **J.L.J.**

### Fourmarierite

Yaping Li, P.C. Burns (2000) Investigations of crystal-chemical variability in lead uranyl oxide hydrates. II. Fourmarierite. *Can. Mineral.*, 38, 737–749.

Single-crystal X-ray structure study of 12 crystals from various localities in the Democratic Republic of Congo confirmed the previously determined orthorhombic unit-cell data and the presence of hydroxyl; the general structural formula is Pb<sub>1-x</sub>[(UO<sub>2</sub>)<sub>4</sub>O<sub>3-2x</sub>(OH)<sub>4+2x</sub>](H<sub>2</sub>O)<sub>4</sub>, for which Pb was found to vary from 0.86 to 1.02, but was 0.50 for a synthetic crystal. **J.L.J.**

### Tinticite

J. Rius, D. Louër, M. Louër, S. Galí, J.C. Melgarejo (2000) Structure solution from powder data of the phosphate hydrate tinticite. *Eur. J. Mineral.*, 12, 581–588.

Rietveld refinement ( $R_{\text{wp}} = 0.131$ ) of X-ray powder data for tinticite from Gavá Brugueras, near Barcelona, Spain, indicated triclinic symmetry, space group *P* $\bar{1}$ ,  $a = 7.965(2)$ ,  $b = 9.999(2)$ ,  $c = 7.644(2)$  Å,  $\alpha = 103.94(2)$ ,  $\beta = 115.91(2)$ ,  $\gamma = 67.86(2)^\circ$ ;  $D_{\text{meas}} = 2.94$ ,  $D_{\text{calc}} = 2.88$  g/cm<sup>3</sup> for Fe<sub>3.34</sub>[(PO<sub>4</sub>)<sub>3.62</sub>(VO<sub>4</sub>)<sub>0.38</sub>]<sub>Σ4.00</sub>·6.7H<sub>2</sub>O. The mineral occurs as platy grains with a maximum dimension of about 1 μm.

**Discussion.** Previous studies had indicated the mineral to be monoclinic (*Am. Mineral.*, 74, p. 1404) or orthorhombic (*Am. Mineral.*, 77, 1308). **J.L.J.**

### Umohoite

S.V. Krivovichev, P.C. Burns (2000) Crystal chemistry of uranyl molybdates. I. The structure and formula of umohoite. *Can. Mineral.*, 38, 717–726.

Single-crystal X-ray structure study ( $R = 0.046$ ) of umohoite, from an unspecified locality in the former U.S.S.R. and obtained from the Fersman Mineralogical Museum, Moscow, gave triclinic symmetry, space group *P* $\bar{1}$   $a = 6.3748(4)$ ,  $b = 7.5287(5)$ ,  $c = 14.628(1)$  Å,  $\alpha = 82.64(1)$ ,  $\beta = 85.95(1)$ ,  $\gamma = 89.91(1)^\circ$ ,  $D_{\text{calc}} = 4.457$  g/cm<sup>3</sup> for  $Z = 4$ . The mineral had been variously described as hexagonal, orthorhombic, monoclinic, and triclinic. The structurally derived formula is [(UO<sub>2</sub>) MoO<sub>4</sub>(H<sub>2</sub>O)]H<sub>2</sub>O. **J.L.J.**