

## NEW MINERAL NAMES\*

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### Bellbergite\*

B. Rüdinger, E. Tillmanns, G. Hentschel (1993) Bellbergite: A new mineral with the zeolite structure type EAB. *Mineral. Petrology*, 48, 147–152.

Electron microprobe analysis (H<sub>2</sub>O by difference) gave SiO<sub>2</sub> 34.41, Al<sub>2</sub>O<sub>3</sub> 27.90, BaO 1.22, Na<sub>2</sub>O 0.70, K<sub>2</sub>O 1.95, SrO 7.63, CaO 9.31, sum 83.12 wt%, corresponding to Ba<sub>0.26</sub>Na<sub>0.72</sub>K<sub>1.33</sub>Sr<sub>2.36</sub>Ca<sub>5.32</sub>Al<sub>17.55</sub>Si<sub>18.36</sub>O<sub>72</sub>·30H<sub>2</sub>O, ideally (K,Ba,Sr)<sub>2</sub>(Sr<sub>2</sub>Ca<sub>2</sub>(Ca,Na)<sub>4</sub>Al<sub>18</sub>Si<sub>18</sub>O<sub>72</sub>·30H<sub>2</sub>O. Occurs typically as subparallel intergrowths, elongate [0001], with transparent, colorless tops and rough, white, lateral faces; rarely as well-formed hexagonal dipyrramids, {10 $\bar{1}$ 2}, up to 0.3 mm long. Vitreous luster, conchoidal fracture, no cleavage,  $H = 5$ ,  $D_{\text{meas}} = 2.20(2)$ ,  $D_{\text{calc}} = 2.19 \text{ g/cm}^3$  for  $Z = 1$ . Optically uniaxial negative,  $\omega = 1.522(2)$ ,  $\epsilon = 1.507(2)$ . Single-crystal X-ray structure study gave a poor  $R$  (0.122) because of a broad mosaic spread and domain structure suggestive of a lack of complete ordering. Hexagonal, possible space groups  $P6_3/mmc$ ,  $P\bar{6}2c$ , and  $P6_3mc$ ,  $a = 13.244(1)$ ,  $c = 15.988(2)$  Å. Strongest lines of the powder pattern (57-mm Debye-Scherrer, CuK $\alpha$ ) are 6.58(80,102), 3.80(100,212,104), 2.95(70,312,214), 2.70(50,402), 2.50(50,410,314), 2.21(70,330), and 1.83(50,416).

The mineral occurs at the hybridized contacts of Ca-rich xenoliths in leucite tephrite at the Bellberg volcano near Mayen, Eifel, Germany. Cavities in the hybrid zone are lined with crystals of sanidine, clinopyroxene, and altered pyrrhotite, on which bellbergite and spheres of thomsonite were deposited and succeeded by tufts of ettringite. The new name is for the locality. Type material is in the Institute for Mineralogy and Crystallography, University of Vienna, Vienna, Austria. J.L.J.

### Bismutocolumbite\*

I.S. Peretazhko, V.E. Zagorskij, A.N. Sapozhnikov, Yu.D. Bobrov, A.D. Rakcheev (1992) Bismutocolumbite Bi(Nb,Ta)O<sub>4</sub>: A new mineral from miarolitic pegmatites. *Zapiski Vses. Mineral. Obshch.*, 121(3), 130–134 (in Russian).

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

Microprobe analysis (average) gave Ta<sub>2</sub>O<sub>5</sub> 11.67, Nb<sub>2</sub>O<sub>5</sub> 27.03, SnO<sub>2</sub> 0.08, TiO<sub>2</sub> 0.06, PbO 0.13, Bi<sub>2</sub>O<sub>3</sub> 59.85, Sb<sub>2</sub>O<sub>3</sub> 0.28, sum 99.10 wt%, corresponding to (Bi<sub>0.99</sub>Sb<sub>0.01</sub>)<sub>1.00</sub>-(Nb<sub>0.79</sub>Ta<sub>0.21</sub>)<sub>1.00</sub>O<sub>4</sub>. Occurs as black, elongate crystals up to 1–2 mm long and 0.5–1 mm thick, showing well-formed orthorhombic prismatic { $h0l$ } faces striated perpendicular to the [001] elongation; { $hko$ } faces may occur. Semi-metallic luster, brown streak, conchoidal fracture,  $H = \sim 5.5$ , perfect {001} cleavage,  $D_{\text{meas}} = 7.56$ ,  $D_{\text{calc}} = 7.66 \text{ g/cm}^3$  for  $Z = 4$ . Fragments <0.03 mm are translucent. In transmitted light, brown to light brown, biaxial positive,  $\alpha = 2.38(2)$ ,  $\beta = 2.42(2)$ ,  $\gamma = 2.47(2)$  ( $\lambda = 579 \text{ nm}$ ),  $2V_{\text{calc}} = 85^\circ$ ,  $X = a$ ,  $Y = c$ ,  $Z = b$ . Reflectance (%): 16.7 ( $\alpha$ ), 17.4 ( $\beta$ ), 18.1 ( $\gamma$ ). X-ray powder study showed the mineral to be orthorhombic, space group (by analogy to synthetic BiTaO<sub>4</sub> and BiNbO<sub>4</sub>)  $Pcnn$ ,  $a = 4.992(3)$ ,  $b = 11.731(5)$ ,  $c = 5.677(3)$  Å. Strongest lines of the powder pattern (38 given) are 3.164(100,121), 2.934(90,040), 2.842(45,002), 2.495(45,200), 1.769(45,103), and 1.734(80,161).

The mineral occurs in miarolitic pegmatites of the Malkhanskoe Field, central Transbaikal area, Siberia, Russia, where it is associated with feldspars, quartz, cassiterite, and microlite, and where it forms intergrowths with elbaite and danburite. The name is for the composition by analogy to stibiocolumbite and stibiotantalite. Type material is at the Fersman Mineralogical Museum, Moscow, Russia. J.P.

### Britholite-(Ce), britholite-(Y)

D.C. Noe, J.M. Hughes, A.N. Mariano, J.W. Drexler, A. Kato (1993) The crystal structure of monoclinic britholite-(Ce) and britholite-(Y). *Zeits. Kristallogr.*, 206, 233–246.

Electron microprobe analyses (not given) of britholite-(Ce) from Kipawa, Quebec (optics indeterminate), and biaxial britholite-(Y) from Suishoyama, Japan, respectively correspond to (Ca<sub>2.24</sub>Ce<sub>1.23</sub>Y<sub>0.69</sub>Nd<sub>0.35</sub>La<sub>0.17</sub>Pr<sub>0.17</sub>Gd<sub>0.15</sub>Dy<sub>0.07</sub>Ho<sub>0.05</sub>Sm<sub>0.04</sub>Er<sub>0.04</sub>Eu<sub>0.01</sub>)<sub>25.34</sub>Si<sub>2.79</sub>O<sub>24</sub>[F<sub>0.84</sub>(OH)<sub>0.16</sub>] and (Y<sub>2.27</sub>Ca<sub>1.24</sub>Mn<sub>0.49</sub>Dy<sub>0.26</sub>Fe<sub>0.21</sub>Er<sub>0.12</sub>Nd<sub>0.10</sub>Ce<sub>0.09</sub>Ho<sub>0.09</sub>Sm<sub>0.05</sub>La<sub>0.01</sub>Pr<sub>0.01</sub>Tb<sub>0.01</sub>)<sub>23.06</sub>(Si<sub>2.93</sub>P<sub>0.13</sub>)<sub>23.06</sub>O<sub>24</sub>[F<sub>0.93</sub>(OH)<sub>0.07</sub>]. Single-crystal X-ray structure study gave monoclinic symmetry, space group  $P2_1$ . For britholite-(Ce),  $a = 9.5804$ ,

$b = 9.5901$ ,  $c = 6.9802$  Å,  $\beta = 120.079^\circ$  ( $R_w = 0.046$ ); for britholite-(Y),  $a = 9.4216$ ,  $b = 9.4138$ ,  $c = 6.7639$  Å,  $\beta = 120.0284^\circ$  ( $R_w = 0.036$ ).

**Discussion.** The formulas are stated as calculated on the basis of 13 anions and  $(F + OH) = 1$ , with deviations from the ideal stoichiometry attributed to the uncertainties related to microprobe analyses of REE. Thus, O = 12 rather than 24, but the formulas are not quite balanced. Both minerals are F analogues of britholite. No submission by the authors has been made to the CNMMN (J. A. Mandarino, Chairman CNMMN, oral communication), but the F analogue of britholite-(Ce) has been approved and appears as new mineral 91-027 in the CNMMN abstracts, which are published in most of the major mineralogical journals. **J.L.J.**

#### Lautenthalite\*

O. Medenbach, W. Gebert (1993) Lautenthalite,  $\text{PbCu}_4\text{[(OH)}_6 \mid (\text{SO}_4)_2\text{]} \cdot 3\text{H}_2\text{O}$ , the Pb analogue of devillite: A new mineral from the Harz mountains, Germany. *Neues Jahrb. Mineral. Mon.*, 401–407.

Electron microprobe analysis (one of the three cited) gave PbO 27.7, CuO 38.9,  $\text{SO}_3$  19.7,  $\text{H}_2\text{O}$  by difference 13.7, sum 100 wt%, corresponding to  $\text{Pb}_{0.999}\text{Cu}_{3.397}\text{S}_{1.981}\text{H}_{12.218}$ , ideally  $\text{PbCu}_4\text{[(OH)}_6 \mid (\text{SO}_4)_2\text{]} \cdot 3\text{H}_2\text{O}$ . Infrared spectroscopy confirmed the presence of  $\text{H}_2\text{O}$  and OH. Occurs as bright blue crystals up to  $0.5 \times 0.3 \times 0.03$  mm, and as sheaflike aggregates. Crystals are tabular (100), elongate [010], showing {100}, {010}, {101}, and several less prominent forms; most crystals are twinned on (100). White streak, vitreous luster, transparent, good {001} and {010} cleavages, nonfluorescent,  $D_{\text{calc}} = 3.84$  g/cm<sup>3</sup> for  $Z = 8$ . Reacts readily with HCl to form a residue of  $\text{PbSO}_4$ . Optically biaxial negative,  $\alpha = 1.659(2)$ ,  $\beta = 1.703(2)$ ,  $\gamma = 1.732(2)$ ,  $2V_{\text{meas}} = 79(1)$ ,  $2V_{\text{calc}} = 78^\circ$ , distinct dispersion  $r > v$ ,  $Z = b$ ,  $Y \wedge c = 4^\circ$ , faintly pleochroic with  $X = \text{pale blue}$ ,  $Y = Z = \text{blue}$ . Single-crystal X-ray structure analysis ( $R = 0.059$ ) indicated monoclinic symmetry, space group  $P2_1/c$ ;  $a = 21.642(8)$ ,  $b = 6.040(2)$ ,  $c = 22.544(8)$  Å,  $\beta = 108.2(1)^\circ$ , as refined from the powder pattern (114-mm Debye-Scherrer,  $\text{CuK}\alpha$  radiation). Strongest lines are 5.14(100,400), 4.53(60,310), 3.40(80, 510), 2.631(50,024,024), 2.531(40,421,711), and 2.212(40, 019,019,526).

The mineral, which is the Pb analogue of devilline, occurs on anglesite, accompanied by devilline and serpierite, in vugs in an Ag-rich galena specimen collected at Lautenthal, Harz Mountains, Germany. The new name is for the locality, which is the site of an ancient smelter, and it is thought that the type specimen was smelter-treated. The mineral has also been incompletely described as occurring in slags from the Meadowfoot smelter near Wanlockhead, Scotland, and Öblarn, Steiermark, Austria. Type material is in the Institut für Mineralogie, Ruhr-Universität, Bochum, Germany.

**Discussion.** The new mineral and name were approved by the CNMMN in 1983. **J.L.J.**

#### Nickenichite\*

M. Auernhammer, H. Effenberger, G. Hentschel, Th. Reinecke, E. Tillmanns (1993) Nickenichite, a new arsenate from the Eifel, Germany. *Mineral. Petrology*, 48, 153–166.

Electron microprobe analysis gave  $\text{Na}_2\text{O}$  4.6,  $\text{CaO}$  2.8,  $\text{K}_2\text{O}$  0.1,  $\text{MgO}$  17.9,  $\text{CuO}$  4.7,  $\text{MnO}$  0.5,  $\text{Fe}_2\text{O}_3$  5.5,  $\text{Al}_2\text{O}_3$  1.1,  $\text{As}_2\text{O}_5$  64.3,  $\text{P}_2\text{O}_5$  0.9,  $\text{V}_2\text{O}_5$  0.06, sum 102.5 wt%, corresponding to  $\text{Na}_{0.81}\text{K}_{0.01}\text{Ca}_{0.27}\text{Cu}_{0.32}\text{Mg}_{2.42}\text{Fe}_{0.38}\text{Mn}_{0.03}\text{Al}_{0.12}\text{As}_{3.05}\text{P}_{0.07}\text{O}_{12}$ , which, from the analytical data and single-crystal X-ray structure refinement, gave the idealized formula  $\text{Na}_{0.76}\text{Ca}_{0.41}\text{Cu}_{0.93}(\text{Mg}_{2.33}\text{Fe}_{0.52}\text{As}_{0.12}\text{Mn}_{0.03})_{23.00}\text{[(As}_{2.93}\text{P}_{0.07}\text{O)}\text{O}_{12}]$ , simplified as  $\text{Na}_x\text{Ca}_y\text{Cu}_z(\text{Mg}_3\text{Fe})_3(\text{AsO}_4)_3$  where  $x \approx 0.8$ ,  $y \approx 0.4$ , and  $z \approx 0.4$ . Occurs as bright blue fibrous to long prismatic monoclinic grains up to 0.20 mm long and 0.03 mm in diameter, elongate [10 $\bar{1}$ ], commonly radial or lamellar parallel to (010), some showing {010}, {100}, and {10 $\bar{1}$ }. Vitreous luster, perfect {010} and good {100} and {10 $\bar{1}$ } cleavages,  $H = 3$ , non-fluorescent,  $D_{\text{calc}} = 4.06$  g/cm<sup>3</sup> for  $Z = 4$ . Optically biaxial positive,  $\alpha = 1.714(5)$ ,  $\beta = 1.744(5)$ ,  $\gamma = 1.783(5)$ ,  $2V_{\text{meas}} = 60(6)$ ,  $2V_{\text{calc}} = 84^\circ$ ,  $\gamma \wedge a = 28^\circ$  on (010),  $\beta = b$ , no dispersion. Structure refinement ( $R_w = 0.033$ ) gave  $a = 11.882(4)$ ,  $b = 12.769(4)$ ,  $c = 6.647(2)$  Å,  $\beta = 112.81(2)^\circ$ , space group  $C2/c$ ; structurally related to johillerite and o'danielite. Strongest lines of the powder pattern (57-mm Debye-Scherrer,  $\text{CuK}\alpha$  radiation) are 4.35(40,111), 4.06(50,22 $\bar{1}$ ), 3.56(40,13 $\bar{1}$ ), 3.53(40,310), 3.195(60,11 $\bar{2}$ ), 3.066(40,002,221), 2.744 (intensity reported as 140 on the basis of calculated intensities of 100 and 40 for  $hkl = 240$  and 400, respectively), and 2.605(40,112,132,402).

The mineral, named for the type locality, occurs with vanadinite in a cavity amidst scoria from a Quaternary volcano near the village of Nickenich, Eifel, Germany. Type material is in the Institute for Mineralogy and Crystallography, University of Vienna, Vienna, Austria. **J.L.J.**

#### Olympite

R.K. Rastsvetaeva, A.P. Khomyakov (1992) Crystal structure of the Li-bearing analogue of olympite. *Doklady Akad. Nauk*, 320(4–6), 499–503 (in Russian).

Yu.A. Malinovskii, E.A. Genkina (1992) Crystal structure of olympite  $\text{LiNa}_5[\text{PO}_4]_2$ . *Sov. Phys. Crystallogr.*, 37(6), 772–776.

X-ray structure study ( $R = 0.0374$ ) by Malinovskii and Genkina of olympite gave orthorhombic symmetry, space group  $Pcmm$ ,  $a = 10.154(5)$ ,  $b = 14.819(3)$ ,  $c = 10.143(1)$  Å,  $D_{\text{calc}} = 2.713$  g/cm<sup>3</sup> for  $Z = 8$ . The structurally indicated formula is  $\text{Na}_5\text{LiP}_2\text{O}_8$ . These results differ from those originally given for olympite from the Khibina massif, Kola Peninsula (*Am. Mineral.*, 66, p. 438, 1981): formula  $\text{Na}_3\text{PO}_4$ ,  $a = 10.154$ ,  $b = 14.819$ ,  $c = 10.143$  Å, space group  $Pnma$  or  $Pn2_1a$ ,  $D_{\text{calc}} = 2.85$ ,  $D_{\text{meas}} = 2.8$  g/cm<sup>3</sup>,  $Z = 16$ . Malinovskii and Genkina pointed out that synthetic  $\text{Na}_3\text{PO}_4$  is known only in cubic and tetragonal

structures, and it is suggested that the formula of olympite be revised to the Li-bearing form.

X-ray structure study ( $R = 0.028$ ) by Rastsvetaeva and Khomyakov of olympite from the Lovozero massif gave  $a = 10.130(4)$ ,  $b = 14.810(4)$ ,  $c = 10.141(1)$  Å, space group  $P2_12_12_1$ ,  $D_{\text{calc}} = 2.72$  g/cm<sup>3</sup>,  $Z = 8$ . Replacement of Na by Li is limited by stability constraints. As noted in the title of the paper, the phase is considered to be the Li analogue of olympite, Na<sub>3</sub>PO<sub>4</sub>.

**Discussion.** Neither paper gave chemical data, but there seems to be no doubt about the validity of the Li-bearing phase. Verification of the originally proposed formula Na<sub>3</sub>PO<sub>4</sub> for olympite from the Khibina massif would seem to be appropriate. **J.P.**

#### Orschallite\*

C. Weidenthaler, E. Tillmanns, G. Hentschel (1993) Orschallite, Ca<sub>3</sub>(SO<sub>3</sub>)<sub>2</sub>SO<sub>4</sub>·12H<sub>2</sub>O, a new calcium-sulfite-sulfate-hydrate mineral. *Mineral. Petrology*, 48, 168–177.

Occurs as colorless, transparent cubes to 0.3 mm, vitreous luster,  $H = \sim 4$ , irregular fracture, no cleavage,  $D_{\text{meas}} = 1.90(3)$ ,  $D_{\text{calc}} = 1.87$  g/cm<sup>3</sup>. Rapidly volatilizes under an electron microprobe beam. XRF analysis of the synthetic analogue gave Ca 20.16, S 16.54 wt%, with calculated SO<sub>2</sub> = 21.98 and SO<sub>3</sub> 13.7 wt% for SO<sub>2</sub>:SO<sub>3</sub> = 2:1. The infrared pattern has absorption bands for H<sub>2</sub>O at 3300 and 1630 cm<sup>-1</sup>, for SO<sub>3</sub> at 945 and 630–650 cm<sup>-1</sup>, and for SO<sub>4</sub> at 1100 cm<sup>-1</sup>. TGA of synthetic material showed endothermic dehydration at 120 °C to anhydrite; weight loss was 34.5%, in good agreement with the XRF shortfall of 36.1% and the 36.5% required by the theoretical formula. Optically uniaxial positive,  $\omega = 1.4941(4)$ ,  $\epsilon = 1.4960(4)$ . Single-crystal X-ray structure study ( $R_w = 0.043$ ) indicated hexagonal symmetry, space group  $R\bar{3}c$ ,  $a = 11.350(1)$ ,  $c = 28.321(2)$  Å,  $Z = 6$ . Strongest lines of the powder pattern (57-mm Debye-Scherrer, CuK $\alpha$  radiation) are 8.11 (80,012), 5.73(100,104), 3.63(60,116), 3.28(40,300), 2.69(80,306), and 2.11 (40,229), in good agreement with results for synthetic material (PDF 37–736).

The mineral occurs with clinopyroxene, apatite, and phillipsite in cavities in compact parts of typically porous Quaternary melilite nepheline leucite at Hannebacher Ley, Eifel, Germany. Other cavities contain hannebachite, CaSO<sub>3</sub>·½H<sub>2</sub>O. The new name is for P. Orschall, who discovered the mineral and was also the first to detect hannebachite. Type material is in the Institute for Mineralogy and Crystallography, University of Vienna, Vienna, Austria. **J.L.J.**

#### Rabejacite\*

M. Deliens, P. Piret (1993) Rabejacite, Ca(UO<sub>2</sub>)<sub>4</sub>(SO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub>·6H<sub>2</sub>O, a new uranyl and calcium sulfate from

Lodève, Hérault, France. *Eur. Jour. Mineral.*, 5, 873–877 (in French, English abs.).

Electron microprobe and CHN analyses gave CaO 2.89, UO<sub>3</sub> 80.12, SO<sub>3</sub> 10.91, H<sub>2</sub>O 10.18, sum 104.10 wt%; after normalization to 100% to account for microbeam reaction, the results correspond to Ca<sub>0.76</sub>(UO<sub>2</sub>)<sub>4.15</sub>(SO<sub>4</sub>)<sub>2.02</sub>(OH)<sub>5.78</sub>·5.86H<sub>2</sub>O, ideally Ca(UO<sub>2</sub>)<sub>4</sub>(SO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub>·6H<sub>2</sub>O. Occurs as bright to amber yellow acicular crystals, flattened tablets on {001} to 0.1 mm, or rounded nodules to 0.3 mm; transparent to translucent, vitreous luster, no cleavage,  $H = 3$ ,  $D_{\text{meas}} = 4.1$ ,  $D_{\text{calc}} = 4.31$  g/cm<sup>3</sup> for  $Z = 4$ , light yellow fluorescence under short- and long-wave ultraviolet light. Optically biaxial negative with  $\alpha_{\text{calc}} = 1.617$ ,  $\beta = 1.710(2)$ ,  $\gamma = 1.758(2)$ ,  $2V_{\text{meas}} = 68(2)^\circ$ ,  $X = c$ ,  $Y$  and  $Z$  in the plane of the tablets, weak dispersion  $r > v$ , strongly pleochroic from pale yellow ( $Y$ ) to sulfur yellow ( $Z$ ). Single-crystal X-ray study indicated orthorhombic symmetry, space group not determinable;  $a = 8.73(1)$ ,  $b = 17.09(2)$ ,  $c = 15.72(2)$  Å as refined from the powder pattern (114-mm Debye-Scherrer, CuK $\alpha$  radiation), with strongest lines (11 given) of 7.90(100,002), 3.98(40,123), 3.49(80,222,230), and 3.38(70,231).

The mineral is associated with gypsum and secondary U minerals derived by alteration of pitchblende at Rabejac and Mas d'Alary Village, both a few kilometers from Lodève, France. The new name is for the locality of the first discovery. Type material is in the Institut royal des Sciences naturelles de Belgique at Brussels, Belgium. **J.L.J.**

#### Sb-cosalite

C.H. Lee, H.I. Park, L.L.Y. Chang (1993) Sb-cosalite from Dunjeon gold mine, Taebaeg City, Korea. *Mineral. Mag.*, 57, 527–530.

Data, including electron microprobe analyses, are given for cosalite of composition Pb<sub>2.04</sub>(Bi<sub>0.70</sub>Sb<sub>0.23</sub>)<sub>2</sub>(Ag<sub>0.07</sub>–Cu<sub>0.07</sub>)<sub>2</sub>S<sub>5</sub>.

**Discussion.** Corresponds to antimonian cosalite rather than the Sb analogue of cosalite, as implied from the hyphenated name. The intention here is not to focus on this particular paper, but to point out that such nomenclature, though common, is improper (see *Am. Mineral.*, 72, 1031–1042, especially p. 1034). **J.L.J.**

#### (Au,Pb)<sub>3</sub>TeO<sub>2</sub>, Au<sub>4</sub>Pb<sub>3</sub>Te<sub>2</sub>O<sub>11</sub>, AuAgTe<sub>3</sub>

Changjin Cai (1993) A preliminary study of several gold minerals in the Dongping and other gold deposits. *Acta Mineral. Sinica*, 13(1), 65–71 (in Chinese, English abs.).

#### Mineral A

Occurs in quartz veins and metasomatic-type gold ore hosted by a rock containing quartz and two feldspars. Observed only in mineral concentrates, occurring as green, moderately lustrous inclusions in native gold. The inclu-

sions are up to  $0.125 \times 0.1$  mm and consist of tabular to prismatic to irregular crystals and dendrites up to  $0.063 \times 0.028$  mm; in reflected light,  $H = <$  gold, takes a good polish, no cleavage, color tea brown with a rosy hue, internal reflection absent to very weak, pleochroic from deep tea brown to lighter tea brown, distinctly anisotropic; reflectance percentages (SiC standard, air) at 480, 526, 589, 644, and 656 nm are, respectively, 15.3, 15.3, 18.3, 21.3, 20.4, and 19.1. The average and range of three electron microprobe analyses (O not determined) gave Au 58.46 (57.37–59.86), Pb 16.44 (15.09–17.26), Ca 0.58 (0.53–0.63), Te 15.09 (14.32–15.98), sum 90.57 (88.10–92.67) wt%, corresponding to  $Au_{2.431}Pb_{0.644}Te_{1.000}O_{2.000}$ , ideally  $(Au,Pb)_3TeO_2$ .

### Mineral B

Occurs as dark green inclusions of moderate luster in native gold, associated with mineral A. The inclusions are aggregates, up to  $0.155 \times 0.015$  mm, consisting of anhedral grains and elongate-tabular to crescent-shaped crystals, with the crystals up to  $15 \times 35$   $\mu$ m.  $H = <$  gold, cleavage or parting parallel to elongation, good polish. Strongly pleochroic in reflected light, from deep olive green with a purplish tint to light olive green; internal reflection very weak or absent, strongly anisotropic from brown to dark green; tarnishes in air after a few days. Maximum and minimum reflectance percentages in air (SiC standard) at 480, 546, 589, 644, and 656 nm are, respectively, 17.4, 14.0; 23.5, 14.0; 26.1, 14.5; 28.6, 16.0; 29.5, 17.4. The average and range of four electron microprobe analyses (O not determined) gave Au 39.83 (38.57–40.75), Pb 33.57 (33.40–33.91), Te 10.98 (10.72–11.44), sum 84.38 (82.92–85.12) wt%, corresponding to  $Au_{3.926}Pb_{3.066}Te_{1.657}O_{10.000}$ , simplified as  $Au_4Pb_3Te_{1.66}O_{10}$  or  $Au_4(PbO)_3(TeO_4)_2$ .

### Mineral C

Mineral C was observed as anhedral inclusions up to 4  $\mu$ m in diameter in native gold in heavy mineral concentrates from quartz veins in plagioclase amphibolite. In reflected light, light blue with a purplish tint, isotropic, and without internal reflection. Electron microprobe analysis gave Au 39.00, Ag 23.39, Te 37.61 (sum 100 wt%), corresponding to  $Au_{0.89}Ag_{0.98}Te_{3.00}$ . **J.L.J.**

### $Mo_3Se_4, Mo_3Te_4$

J. Pašava, P. Sulovský, M. Kovalová (1993) Geochemistry and mineralogy of Proterozoic metal-rich black shales from the Bohemian massif, Czech Republic, with a description of possible new molybdenum selenide and telluride phases. *Can. Mineral.*, 31, 745–754.

Electron microprobe analyses gave Mo 44.39, 46.54, 46.27, Fe 0.80, 0.66, 1.24, Si 2.14, 0.84, –, Se 44.46, 47.44, 46.76, Al 2.21, 1.69, –, Cu 1.15, 1.06, 1.20, sum 95.15, 98.23, 95.47 wt%, with inferred stoichiometry  $Mo_{3.28}Se_{4.00}$ ,  $Mo_{3.23}Se_{4.00}$ , and  $Mo_{3.26}Se_{4.00}$ .

Two of three electron microprobe analyses of an associated telluride phase gave Mo 33.94, 33.56, Te 62.06, 63.71, Fe 1.04, 0.74, Si –, 0.86, sum 97.04, 98.87 wt%, with inferred stoichiometry  $Mo_{2.94}Te_{4.00}$  and  $Mo_{2.80}Te_{4.00}$ . The selenide and telluride occur sparingly as grains, about 4  $\mu$ m, that are closely associated with layers rich in organic matter and with layers rich in framboidal pyrite in Proterozoic black shales. Also present are sphalerite, chalcopyrite, galena, molybdenite, native gold, berthierite, and clausthalite. **J.L.J.**

### Unnamed Ca-Mg silicate

K.A. Lazebnik, L.V. Nikishova, Yu.D. Lazebnik, V.F. Makhotko (1992) Turquoise-colored calcium-magnesium silicate from charoitites. *Doklady Akad. Nauk.* 320(4–6), 561–565 (in Russian).

Microprobe analyses gave highly variable compositions (extreme cases and average, respectively): SiO<sub>2</sub> 53.28, 55.34, 54.79, MgO 0.51, 19.56, 5.54, CaO 24.40, 4.85, 17.94, BaO 0.21, 0.91, 0.42, K<sub>2</sub>O 5.81, 2.91, 4.42, Na<sub>2</sub>O 0.03, 0.44, 0.13, F –, –, 0.82, H<sub>2</sub>O (by difference) 15.62, 17.25, 15.94, sum 100 wt%, corresponding to  $K(Ca,Mg)_6[Si_{11}O_{28}](OH)_2F \cdot 10H_2O$ . Occurs as greenish blue sheaflike aggregates 2–3 mm in length. Individual crystals are up to 1 mm long and 0.02 mm thick, pale blue, long prismatic to acicular.  $D_{meas} = 2.35$ – $2.40$ ,  $D_{calc} = 2.40$  g/cm<sup>3</sup>. Colorless in transmitted light, transparent, biaxial,  $\alpha = 1.537(1)$ ,  $\gamma = 1.545(1)$ . Elongation positive,  $Z$  parallel to it,  $Z \wedge$  extinction =  $\sim 3^\circ$ . Intergrowths weakly colored; some are pleochroic ( $Z =$  pale turquoise,  $X =$  pinkish gray). X-ray and electron diffraction study showed the mineral to be triclinic (pseudomonoclinic),  $a = 12.65(6)$ ,  $b = 19.35(9)$ ,  $c = 7.14(3)$  Å,  $\alpha = 90.0(1)$ ,  $\beta = 102.2(1)$ ,  $\gamma = 90.2(1)^\circ$ . The powder pattern is similar to those of charoite and tokkoite, with diagnostic lines at 2.583, 1.959, and 1.577. Strongest lines are 7.8(70,120), 3.56(80,102), 3.35(80,151), 2.975(70,232), and 2.492(100, 351,511). The mineral occurs in charoitic rocks of the Magistralnyj part of the Sirenevyy deposit, Russia.

**Discussion.** The authors report that the data and the proposed new mineral name boleflite were submitted to the CNMMN, but approval was not given because of the highly variable composition and the lack of some data. It is ironic to see that the authors' notification of the lack of approval also incorporates the publication of the rejected name. **J.P.**

### New Data

#### Iriginite

V.N. Serezhkin, V.F. Tshubaev, L.M. Kovba, V.K. Trunov (1973) The structure of synthetic iriginite. *Doklady Akad. Nauk SSSR Ser. Chem.*, 210(4), 873–876 (in Russian).

A.I. Vishnev, A.I. Gorshkov, O.V. Fedorov (1991) Iriginite according to the data of electron microscopy and electronography. *Izvestia Akad. Nauk SSSR, Ser. Geol.*, 1991(7), 143–149 (in Russian).

Crystal structure determination of synthetic iriginite (Serezhkin et al., 1973) showed it to be orthorhombic, space group *Pcam* or *Pca2<sub>1</sub>*,  $a = 12.77$ ,  $b = 6.715$ ,  $c = 11.53$  Å,  $Z = 4$ , and the formula of the mineral to be  $\{UO_2[Mo_2O_7(H_2O)_2]\} \cdot H_2O$ . Electron diffraction study of natural iriginite gave space group *Pca2<sub>1</sub>*,  $a = 12.21$ ,  $b = 6.62$ ,  $c = 11.46$ , Å. **J.P.**

### Stibiconite

J.G. Stevens, R.M. Etter, E.W. Setzer (1993) <sup>121</sup>Sb Mössbauer spectroscopic study of the mineral stibiconite. *Nuclear Instruments and Methods in Physics Research, B76*, 252–253.

Mössbauer spectra were obtained for stibiconite samples from five localities; chemical analyses for three of the samples gave Ca 2.37–5.03, Sb 26.18–28.78 wt%, with the relative atomic percentages for Ca, Sb<sup>3+</sup>, and Sb<sup>5+</sup> being, respectively, 34.7, 2.0, 63.3; 29.1, 14.4, 56.5; 21.6, 29.5, 48.9. Sb<sup>3+</sup> increases linearly as Ca decreases, and Sb<sup>3+</sup> and Sb<sup>5+</sup> also vary linearly. The proposed new formula is  $Ca_{4x}Sb_{3-8x}^{3+}Sb_{1+4x}^{5+}(O,OH,H_2O)_y$ , in which  $0 < x < 3/8$ . **J.L.J.**

### Stilbite

M. Akizuki, Y. Kudoh, H. Satoh (1993) Crystal structure of the {001} growth sector of stilbite. *Eur. Jour. Mineral.*, 5, 839–843.

Chemically homogeneous crystals of stilbite from Poonna, India, show that the {001} growth sector is orthorhombic whereas the {101} sector is monoclinic. Single-crystal X-ray structure study ( $R = 0.088$ ) of the {001} sector gave  $a = 13.616(2)$ ,  $b = 18.238(3)$ ,  $c = 17.835(2)$  Å, space group *Fmmm*,  $Z = 2$ , isomorphous with stellerite. Optically there are small deviations that reduce the symmetry to triclinic. **J.L.J.**

### Discredited Mineral

#### Bellite

E.H. Nickel, G.J. Hitchen (1993) 'Bellite' revisited. *Mineral Mag.*, 57, 538–548.

Investigation of museum specimens of bellite, probably type material, from the Magnet mine, Russell County, Tasmania, confirmed that the material is P-Si-Cr-bearing mimetite rather than a "chrome-arsenate of lead," as was originally proposed in 1905. **J.L.J.**