

## NEW MINERAL NAMES

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**Bohdanowiczite**

MARIAN BANAS AND JOACHIM OTTEMANN (1967) Bohdanowiczite, a new silver bismuth selenide from Kletna. *Sudeten. Przgl. Geol.*, **15**, 240 [in Polish].

A mineral thought to be matildite was found by microprobe analysis (not given) to be  $\text{AgBiSe}_2$ . The name is for Professor Karol Bohdanowicz of Krakow.

DISCUSSION.—Names should not be published without data.

**Manjiroite**

MATSUO NAMBU AND KATSUTOSHI TANIDA (1967) Manjiroite, a new manganese dioxide mineral, from Kohare Mine, Iwate Prefecture, Japan. *Jour. Jap. Assoc. Mineral., Petrol., Econ. Geol.*, **58**, 39–54 [Japanese with English summary].

Analysis gave  $\text{MnO}_2$  85.79,  $\text{MnO}$  3.18,  $\text{Fe}_2\text{O}_3$  0.40,  $\text{Al}_2\text{O}_3$  0.62,  $\text{CuO}$  0.03,  $\text{CoO}$  none,  $\text{ZnO}$  0.03,  $\text{MgO}$  0.18,  $\text{CaO}$  0.22,  $\text{Na}_2\text{O}$  2.99,  $\text{K}_2\text{O}$  1.39,  $\text{BaO}$  0.16,  $\text{H}_2\text{O}^{(+)}$  3.92,  $\text{H}_2\text{O}^{(-)}$  0.68,  $\text{TiO}_2$  none,  $\text{SiO}_2$  0.12, sum 99.71%. This gives for  $\text{O} = 16$ , the formula



Four additional analyses are given from two other localities; they show  $\text{Na}_2\text{O}$  1.84–1.90,  $\text{K}_2\text{O}$  1.9202, 27%;  $\text{Na} > \text{K}$  in all. Manjiroite is therefore the Na analogue of cryptomelane, with which it probably forms an isomorphous series.

Indexed X-ray powder data are given. The strongest lines are 7.017 (98)(110), 4.941 (77)(200), 3.136 (92)(130), 2.406 (100)(121), 2.160 (69)(301), 1.839 (46)(141), 1.548 (46)(251). The mineral is tetragonal,  $a$  9.916,  $c$  2.864 Å.

The mineral is dark brownish-gray, luster dull, streak brownish-black.  $G$  4.29, Vickers hardness 181, average. No cleavage, marked conchoidal fracture. Under the microscope opaque, distinctly anisotropic, with weak pleochroism. DTA shows endothermic effects at 530°, 905°, and 980°. Bixbyite and hausmannite were formed when the mineral was heated.

The mineral occurs in the oxidation zone of rhodonite—tephroite—rhodochrosite bedded ore deposits of Kohare Mine and 5 other deposits, Iwate Prefecture, in dense compact mass up to  $10 \times 8 \times 5$  cm. Associated minerals are pyrolusite, nsutite, birnessite, cryptomelane, and goethite.

The name is for Manjiro Watanabe, Emeritus Professor, Tohoku University. It was approved before publication by the Commission on New Minerals and Mineral Names, IMA.

**Sukulaite**

ATSO VORMA AND JAAKKO SIIVOLA (1967) Sukulaite- $\text{Ta}_2\text{Sn}_2\text{O}_7$ —and wodginite as inclusions in cassiterite in the granite pegmatite in Sukula, Tammela, in S. W. Finland. *Bull. Comm. Geol. Finlande* **229**, 173–187.

Cassiterite samples collected about 100 years ago were found to be high in  $\text{Ta}_2\text{O}_5$  (up to 6%) and  $\text{Nb}_2\text{O}_5$  (up to 1%). Inclusions present include tapiolite, iron-rich wodginite native Bi, and the new mineral, forming narrow rims around wodginite, and in small grains replacing wodginite almost completely. Electron microprobe analysis by J.S. gave  $\text{Ta}_2\text{O}_5$  47,  $\text{Nb}_2\text{O}_5$  8,  $\text{TiO}_2$  1,  $\text{MnO}$  2,  $\text{FeO}$  1.7,  $\text{SnO}$  40, sum 99.7% (but the tin is probably divalent, on structural grounds).

X-ray powder data showed the mineral to be cubic, isostructural with microlite (hence

with space group  $Fd\bar{3}m$ ,  $a=10.57\text{\AA}$ . The strongest lines are: 3.046 (vs)(222), 2.640 (ms)(400), 1.866 (s)(440), 1.589 (s)(622), 1.524 (m)(444), 1.2105 (m)(662), 1.180 (m)(840), 1.017 (m). 0.894 (m).  $\text{Ta}_2\text{Sm}_2\text{O}_3$  was synthesized by Gasperin [C. R. Acad. Sci. Paris, **240**, 2340-2342 (1955)], who found it to be cubic,  $a=10.48\text{\AA}$ ,  $G. 8.34$ .

Sukulaite is yellowish-brown, translucent; under reflected light, gray with a reddish or lilac tint. Reflectivity 13% higher than that of cassiterite. Polishing hardness greater than that of cassiterite or wodginite. Under crossed nicols shows strong internal reflections in reddish brown.

The name is for the locality. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA.

#### Unnamed monoclinic dimorph of ilvaite

PAUL BARTHOLOME, J. C. DUCHESNE, AND L. VAN DER PLAS (1968) Sur une forme monoclinique de l'ilviate. *Ann. Soc. Geol. Belg., Bull.*, **90** (1966-1967), 779-788.

Comparison of X-ray patterns of a number of samples of ilvaite showed that some of them, notably samples from San Leon, Sardinia, and Hanover, New Mexico, have broadening of lines and also splitting of lines with indices  $1k2$ , corresponding to a monoclinic cell with  $\beta=90^\circ 25'$  for the San Leon sample. This material contained  $\text{Fe}^{2+}$  23.0, Mn 3.07,  $\text{H}_2\text{O}$  2.31%, normal for ilvaite.

#### Monsmedite

V. MANILICI, D. GIUSCA AND VICTORIA STIOPOL (1965) Study of the Baia Sprie deposit, Baia Mare region. *Mem. Com. Geol. Romania* **7**, 1-113 [in Roumanian with French summary] [Mineral. Abstr., **18**, 285 (1967)].

The mineral is stated to have the composition:  $\text{K}_2\text{O} \cdot \text{Ti}_2\text{O}_3 \cdot 8\text{SO}_3 \cdot 15\text{H}_2\text{O}$  (analysis not given). Color dark green to black, nearly opaque in large crystals, luster pitchy. Forms  $\{111\}$  and  $\{110\}$ . Orthorhombic; cleavages prismatic and pyramidal.  $G. 3. H > 2$ . Biaxial,  $2V=52^\circ$  (sign not given),  $r > v$ ,  $\beta \sim 1.608$ , birefringence 0.011. Occurs in geodes with marcasite and barite on kaolinite and limonite. The name is for the Latin name "Mons Medius" of Baia Sprie.

DISCUSSION.—Insufficient data to justify a new name. The composition is unique.

#### Rodalquilarite

J. SIERRA LOPEZ, G. LEAL, R. PIERROT, Y. LAURENT, J. PROTAS, AND Y. DUSAUSOY (1968) La rodalquilarite, chlorotellurite de fer, un nouvelle espece minerale. *Bull. Soc. Franc. Mineral. Cristallogr.*, **91**, 28-33.

Microchemical analyses by J. Fritsche of the mineral (61 mg) and of material synthesized by R. V. Gaines (73 mg) gave respectively:  $\text{TeO}_2$  72.85, 73.15;  $\text{Fe}_2\text{O}_3$  18.45, 18.65; Cl 4.80, 4.60;  $\text{H}_2\text{O}$  4.50, 4.25, insol. 0.35, 0.25, sum 100.95, 100.90—( $\text{O}=\text{Cl}_2$ ) 1.08, 1.02 = 99.87, 99.88%. Microprobe analysis of the mineral by R. Giraud gave  $\text{TeO}_2$   $71.1 \pm 1$ ,  $\text{Fe}_2\text{O}_3$   $17.3 \pm 1$ , Cl 2.3%. These lead to ratios  $\text{TeO}_2:\text{Fe}_2\text{O}_3:\text{Cl}:\text{H}_2\text{O}=4:1:1.1:2.1$  or  $\text{H}_3\text{Fe}(\text{TeO}_3)_4\text{Cl} \cdot 0.5\text{H}_2\text{O}$ . However, structural analysis indicates the formula  $\text{H}_3\text{Fe}_2(\text{TeO}_3)_4\text{Cl}$ .

Dehydration curves on natural and synthetic rodalquilarite show losses of weight, respectively, 4.3, 4.5% to  $500^\circ$ ; not determined, 5.1% to  $655^\circ$ , 6.3, 6.5% to  $775^\circ$  and  $805^\circ$ . A DTA curve on synthetic material shows a large endothermic break with double peak at  $45^\circ$  and  $470^\circ$ , followed by a very complex curve with exothermal peaks at  $500^\circ$ ,  $550^\circ$ ,  $880^\circ$ , and  $1025^\circ$ .

X-ray study showed the mineral to be triclinic,  $a$  8.89,  $b$  5.08,  $c$  6.63 $\text{\AA}$ ,  $\alpha$   $103^\circ 10'$ ,  $\beta$   $107^\circ 5'$ ,  $\gamma$   $77^\circ 52'$ ,  $V=275.9\text{O}\text{\AA}^3$ ,  $Z=1$ .  $G.$ , calculated for  $(\text{H}_3\text{Fe}_2(\text{TeO}_3)_4\text{Cl}, 5.14; G. \text{mea-}$

sured natural 5.05–5.15, synthetic 4.95–5.05. The strongest X-ray lines (28 given) are 4.24 (vvs)(0 $\bar{1}\bar{1}$ ), 2.85 (ms)( $\bar{3}01$ , 212), 2.62 (vs)(310), 2.17 (s)( $\bar{2}21$ ,  $\bar{4}01$ ).

Color grass-green to emerald-green, luster greasy. One good cleavage. *H.* 2–3, very brittle, easily crushed to a greenish-yellow powder. Optically biaxial, negative,  $2V=38 \pm 5^\circ$ , *ns* alpha and gamma between 2.1 and 2.2, average reflectivity at 525 nm 14–15%. Not pleochroic.

The mineral occurs in tiny stout crystals, mostly less than 0.1 mm. and in crusts in quartz geodes in the zone of oxidation of the Rodalquilar gold deposit. Almeria Province, Spain, associated with native gold, jarosite, and rare emmonsite. It is probably an alteration product of gold tellurides.

The name is for the locality; it was approved (vote 18–0) before publication by the Commission on New Minerals and Mineral Names, IMA.

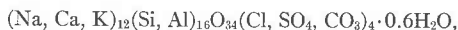
### Afghanite

P. BARIAND, F. CESBRON, AND R. GIRAUD (1968). Une nouvelle espece minerale: l'afghanite de Sar-e-Sang, Badakhshan, Afghanistan. Comparison avec les mineraux du groupe de la cancrinite. *Bull. Soc. Franc. Mineral. Cristallogr.*, 91, 34–42.

Analysis on 150 mg. by J. Fritsche gave SiO<sub>2</sub> 30.8, Al<sub>2</sub>O<sub>3</sub> 25., CaO 16.5, Na<sub>2</sub>O 12.6, K<sub>2</sub>O 2.7, SO<sub>3</sub> 8.5, Cl 4.6, CO<sub>2</sub> 0.4, H<sub>2</sub>O 0.7, sum 101.70—(O = Cl<sub>2</sub>) 1.04 = 100.66%. Electron probe analysis gave SiO<sub>2</sub> 28.9, Al<sub>2</sub>O<sub>3</sub> 23.8, CaO 17.4, K<sub>2</sub>O 2.8, SO<sub>3</sub> 8.3, Cl 5.5%. The SO<sub>3</sub> is total sulfur; a little of it is present as sulfide. This leads to the formula:



or



with  $Z=3$ , a member of the cancrinite group close in composition to sulfatian cancrinite (vishnevite).

X-ray study shows the mineral to be hexagonal, possible space groups  $P6_3/mmc$ ,  $P6_3/mc$ , or  $P\bar{6}2c$ ,  $a$  12.77,  $c$  21.35Å. Cancrinite ( $P6_3$ ) has  $a$  12.60,  $c$  5.13; davyne ( $P6_3/m$  or  $P6_3$ ) has  $a$  12.70  $c$  5.33; microsommite has  $a$  22.08 ( $12.75 \times \sqrt{3}$ ),  $c$  5.33Å. The strongest X-ray lines of afghanite are 6.00 (ms)(10.3), 4.82 (vs)(10.4), 3.997 (s)(10.5), 3.688 (vvs)(30.0), 3.298 (vvs)(12.4), 2.685 (s)(40.2), 2.460 (ms)(11.8), 2.130 (s)(33.0), 2.057 (ms)(12.9), 1.792 (s)(43.2, 50.7).

Color bluish, transparent, *G.* (Westphal balance) 2.55, calculated 2.65, *H.*  $5\frac{1}{2}$ –6. Cleavage (10.0) perfect. Optically uniaxial, positive, *ns* (Na)  $\omega=1.523$ ,  $\epsilon=1.529$ , both  $\pm 0.002$ .

The mineral occurs in the lapis lazuli mine at Sar-e-Sang, Badakhshan Province, Afghanistan. It forms the core of a crystal of lazurite, associated with sodalite, nepheline, phlogopite, olivine, and pyrite [see Blaise and Cesbron, *Bull. Soc. Franc. Mineral. Cristallogr.*, 89, 333–343 (1966)]. The name is for the country of occurrence. It was approved in advance of publication by the Commission on New Minerals and Mineral Names, IMA.

### NEW DATA

Stannite, mawsonite, kesterite, idaite, briartite, renierite, germanite, colusite, luzonite, stibioluzonite, enargite, goldfiedlite

CLAUDE LEVY (1968) Contribution a la mineralogie des sulfures de cuivre du type Cu<sub>3</sub>XS<sub>4</sub>. *Mem. Bur. Rech. Geol. Minières* 54, 1–178.

New electron microprobe analyses, X-ray powder data, DTA, TGA, and reflectivities at 12 wave lengths are given for the minerals listed and others.

*Stannite Group*: In the series  $(\text{Cu}, \text{Zn})_{2+x}\text{FeSn}_{1-x}\text{S}_4$ , normal stannite has  $x=1$ ; "yellow stannite" has  $x=0.39-0.84$ ; "orange bornite" has  $x=0.65-0.86$  and is identical with mawsonite [*Amer. Mineral.* **50**, 900-908 (1955)]. The term "orange bornite" should be dropped. A new analysis confirms the validity of kesterite [*Amer. Mineral.*, **43**, 1222 (1958); **44**, 1329 (1959)] as  $\text{Cu}_2\text{ZnS}_4$ . New analyses give the formula of idaite [*Amer. Mineral.*, **43**, 1219 (1958); **48**, 672-678 (1963)] as  $\text{Cu}_3\text{FeS}_4$ , not  $\text{Cu}_3\text{FeS}_6$ , corresponding to  $x=1$  in the general series.

Briartite and renierite are members of a series  $\text{Cu}_{2+x}\text{FeGe}_{1-x}\text{S}_4$ , with  $x=0$  for briartite,  $x=0.53-0.70$  for renierite. Germanite is  $\text{Cu}_8\text{FeGeS}_8$ .

New analyses confirm the tetragonal series  $\text{Cu}_3\text{AsS}_4\text{-Cu}_3\text{SbS}_4$ , called luzonite-stibio-luzonite. It is recommended that the name famatinite be dropped. No Sb analogue of orthorhombic enargite was found (max. Sb 4.9%).

Colusite is  $\text{Cu}_3(\text{Sn}, \text{V}, \text{As})\text{S}_4$ ; the Te previously reported is present as an admixed Te-rich member of the tetrahedrite group. Goldfieldite [*Amer. Mineral.*, **32**, 254 (1947)] is a member of the tetrahedrite group,  $\text{Cu}_3(\text{Te}, \text{Sb}, \text{As})\text{S}_4$ , with Te:Sb:As = 55:29:13, and is therefore a valid species.

#### DISCREDITED MINERALS

##### Gamsigradite (=Hornblende)

L. MARIC (1968) Timazit, eine neue Gesteinsart, und Gamsigradit, ein neuer Amphibol, mit beiläufigen Bemerkungen von August Breithaupt. *Freiberger Forschungsh.*, **C230**, 55-60.

A new analysis of material from the type locality by V. Majer gave  $\text{SiO}_2$  43.97,  $\text{Al}_2\text{O}_3$  11.90,  $\text{Fe}_2\text{O}_3$  4.85,  $\text{MgO}$  13.08,  $\text{MnO}$  0.44,  $\text{CaO}$  11.16,  $\text{Na}_2\text{O}$  1.94,  $\text{K}_2\text{O}$  0.79,  $\text{TiO}_2$  1.91,  $\text{P}_2\text{O}_5$  tr.,  $\text{H}_2\text{O}^-$  1.95,  $\text{H}_2\text{O}^+$  0.26, sum 100.42%. Gamsigradite [Breithaupt, 1861] is therefore a common hornblende.

##### Bergamaschite—a mixture

ANNIBALE MOTTANA (1967) Riesame della "bergamaschite": *Rend. Ist. Lombardo Accad. Sci. Lett., Sci. Mat., Fis., Chim. Geol.*, **101A**, 159-167.

The mineral bergamaschite (bergamaskite) described by Lucchetti in 1881, has previously been classed, with some doubt, as an amphibole near hastingsite, but nearly free of Mg. X-ray and optical study of type material show it to be a mixture of common hornblende, calcite, and chlorite-vermiculite. Analysis of purified hornblende (complete analysis given) shows  $\text{MgO}$  12.11%. The name should be discarded.