

NEW MINERAL NAMES

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Uralborite, Pentahydroborite

S. V. MALINKO, New boron minerals—uralborite and pentahydroborite. *Zapiski Vses. Mineral. Obschch.*, **90**, 673–681 (1961) (in Russian).

The minerals were found in the same skarn deposit in the Urals from which the new calcium borates calcioborite, frolovite and nifontovite, have previously been described (*Am. Mineral.* **41**, 815 (1956); **43**, 385 (1958); **47**, 172 (1962)).

Uralborite occurs in radiating-fibrous aggregates of columnar crystals up to 0.5–0.7 cm., associated with garnet, magnetite, szaibelyite, and frolovite. The crystals are prismatic, transparent, with a distinct cleavage parallel to the elongation. H about 4, G 2.60. Luminesces violet in long ultra-violet. The mineral is biaxial (+) with α 1.604, β 1.609, γ 1.615 (all \pm 0.001), 2V 85°. The normal to the plane of cleavage makes an angle of 86–90° with Z, 90° with Y. Dispersion strong, $r > v$; anomalous dark blue and brown interference colors are sometimes observed.

Analysis by N. N. Kuznetsova and G. V. Rozovskaya gave SiO₂ 4.00, Al₂O₃ 1.12, Fe₂O₃ 2.13, CaO 35.27, MgO 0.67, B₂O₃ 38.06, H₂O⁺ 19.08, H₂O⁻ none, sum 100.33%. After deducting andradite-grossular garnet and szaibelyite, this gives CaO:B₂O₃:H₂O = 1.05:1:1.95 or CaB₂O₄·2H₂O. Spectrographic analysis also showed 0.01–0.001% of Mn, Cu and Ag. At room temperature the mineral is soluble slowly in 10% HCl, insoluble in dilute acetic acid; the solubility increases on warming. Thermal analysis by L. I. Rybakova showed a strong endothermal effect at 341° and two weak ones at 450° and 641°, and an exothermal effect at 725° C.

The x-ray pattern by G. A. Sidorenko (47 lines) shows strongest lines: 7.61 (10), 2.13 (10), 2.97 (9), 1.407 (8), 6.18 (6), 3.42 (6), 4.81 (5), 2.72 (5), 2.05 (5), 1.830 (5).

The name is for the locality and the composition.

Pentahydroborite occurs with garnet, magnetite and szaibelyite in small grains, showing no crystal form or cleavage. Colorless, H 2.5, G 2.00. Luminesces violet in long ultra-violet light. The mineral is biaxial (+), α 1.531, β 1.536, γ 1.544 (all \pm 0.001), 2V 73°.

Analysis by N. N. K. and G. V. R. gave SiO₂ 2.80, Al₂O₃ 1.13, Fe₂O₃ 1.87, CaO 27.27, MgO 0.66, B₂O₃ 28.35, H₂O⁺ 37.78, H₂O⁻ none, sum 99.86%. After deducting a little andradite-grossular garnet and szaibelyite, this gives CaO:B₂O₃:H₂O = 1.1:1.0:5.2 or CaB₂O₄·5H₂O. Spectrographic analysis also showed about 0.01% Mn. DTA by L.I.R. showed two sharp endothermal effects at 168° and 184° and an exothermal effect at 715° C.

The x-ray powder pattern by G.A.S. showed 24 lines of which the strongest are 7.04 (10), 2.99 (9), 3.54 (8), 1.937 (8), 2.88 (6).

The name is for the composition.

DISCUSSION.—Uralborite is given as CaB₂O₄·2H₂O, nifontovite as CaB₂O₄·2.3H₂O. The indices of refraction and G of the latter are so much lower that it seems certain that it is a higher hydrate, possibly CaB₂O₄·H₂O, like frolovite. The n_s and G of pentahydroborite are higher than those reported for synthetic CaB₂O₄·6H₂O. X-ray study of these natural and synthetic borates is needed.

Glushinskite, Zhemchuzhnikovite

YU. A. ZHEMCHUZHNIKOV AND A. I. GINZBURG, Petrology of clays, *Izdatel. Akad. Nauk SSSR*, 1960, p. 93; from abstracts by E. M. Bohnstedt-Kapletakaya, *Zapiski Vses. Mineral. Obschch.* **92**, 204 (1962).

There are described, on the basis of a personal communication from E. I. Nefedov, two oxalates, occurring in chalky clays of some Arctic deposits of the U.S.S.R.

Glushinskite is a magnesium oxalate. Slowly soluble in water, easily dissolved by HCl. Orthorhombic, platy. Colorless. H 2, G 1.86. Biaxial (-), α 1.365, β 1.530, γ 1.595.

Zhemchuzhnikovite is $\text{NaMg}(\text{Fe}, \text{Al})(\text{C}_2\text{O}_4)_3 \cdot 8-9 \text{H}_2\text{O}$. Soluble in water. Green to violet. H 2-3, G 1.62. Trigonal, Uniaxial (-), ω 1.468, ϵ 1.408, pleochroic with 0 yellowish, E violet.

DISCUSSION.—Data inadequate. Zhemchuzhnikovite may be an aluminian stepanovite or the Al analogue of stepanovite, see *Am. Mineral.* 40, 551 (1955).

Natroniobite, NaNbO_3

A. G. BULAKH, A. A. KUKHARENKO, YU. N. KNIPOVICH, V. V. KONDRAT'eva, K. A. BAKLANOVA AND E. N. BARANOVA, Some new minerals in carbonatites of the Kola Peninsula. *Vses. nauchno-issled. Geol. Inst.* 1960, 114-116; from an abstract by E. M. Bonshtedt-Kupletskaya in *Zapiski Vses. Mineralog. Obshch.* 92, 190 (1962).

A preliminary report. Analysis gave Nb_2O_5 74.06, Ta_2O_5 0.83, TiO_2 5.56, Fe_2O_3 1.35, Al_2O_3 0.20, MgO 0.35, MnO 0.05, CaO 2.80, RE_2O_3 3.25, ThO_2 0.56, Na_2O 9.08, H_2O 0.67 F not found, SiO_2 0.97, sum 99.73%. The mineral occurs as irregular grains and fine-grained aggregates. Color yellowish, brownish, blackish. H $5\frac{1}{2}$ -6, G 4.40. Biaxial (+), 2V 10-30°, α 2.10-2.13, β 2.19-2.21, γ 2.21-2.24, $r < v$, $c:X' = 10-15^\circ$. Presumably monoclinic. The strongest x-ray lines are 2.97 (10), 3.06 (9), 1.60 (8). The mineral occurs in dolomite carbonatites containing apatite, phlogopite, dysanallyte and pyrochlore, in the Lesnaya Baraka and Sallanlatvi massifs, Kola Peninsula. It forms pseudomorphs after dysanallyte and pyrochlore and is replaced by later pyrochlore.

The name is for the composition.

DISCUSSION.—Apparently a dimorph of lueshite (*Am. Mineral.* 46, 1004 (1961), but further study is needed).

Tynite

L. N. OVCHINNIKOV, Contact-metasomatic deposits of the Middle and Northern Urals. *Trudy Gorno-Geol. Inst. Ural Filial Akad. Nauk SSSR*, 39, 297-298 (1960), from an abstract by E. M. Bonshtedt-Kupletskaya in *Zapiski Vses. Mineral. Obshch.*, 92, 203 (1962).

Analysis by E. V. Prakhova gave SiO_2 47.16, Al_2O_3 2.67, Fe_2O_3 6.97, FeO 22.92, MgO 4.70, MnO 0.23, CaO 12.18, H_2O 3.40, total 100.23%, corresponding to $\text{Ca}_3(\text{Fe}, \text{Mg}, \text{Mn})_7(\text{Fe}, \text{Al})_2(\text{SiO}_3)_{12}(\text{OH})_2 \cdot \text{H}_2\text{O}$. Under the microscope greenish-yellow, has allotriomorphic granular structure. Non-pleochroic, α 1.660 γ 1.673. G 3.19. Found rather abundantly in the exoskarn zone of contact-metasomatic deposits, Sverdlovsk district, developed on hornblende, prehnite, magnetite and ilvaite.

The name is for the Tyny River.

DISCUSSION.—The abstractor considers that insufficient data (no x-ray data, insufficient optics, physical properties) are given. I agree.

Magnesiolaumontite

M. BORCOS, Contributie la studiiul zeolitelor. Magneziolaumontitul de la Musariu. *Studii Cercetari Geol. Acad. Rouman. P.R.* 5, 739-756 (1960), from an abstract by E. M. Bonshtedt-Kupletskaya in *Zapiski Vses. Mineralog. Obshch.* 92, 203-204 (1962).

Analysis by S. Popescu gave SiO_2 51.45, Al_2O_3 22.15, MgO 0.70, MnO 0.08, CaO 11.61, Na_2O 0.37, K_2O 0.08, H_2O 13.70, P_2O_5 , SrO , BaO traces, total 100.14%, corresponding, ac-

cording to the author to $(\text{Ca}, \text{Mg})_6(\text{Si}, \text{Al})_{36}\text{O}_{72} \cdot 19\text{H}_2\text{O}$. (The abstractor gives $(\text{Ca}, \text{Mg})_{7-8}(\text{Si}, \text{Al})_{39,7}\text{O}_{80} \cdot 20.3\text{H}_2\text{O}$). Monoclinic needles with (100), (010) and (001). Transparent, colorless or gray with greenish-yellow tint. Cleavage (010) distinct. H 6. G 2.32. Biaxial (+), with α 1.507–1.510, γ 1.523–1.524, $c \wedge Z = 36-45^\circ$, $2V$ 45–48°. DTA shows three endothermal effects at 200, 315 and 418° C. Most of the water is lost at 500°. Found with other zeolites in cavities in andesite at Musari, Roumania.

DISCUSSION.—The abstractor points out that the relationship to alumontite is difficult to judge in the absence of x -ray data, but the name is unsuitable because of the low content of MgO .

Denningite

J. A. MANDARINO, S. J. WILLIAMS AND R. S. MITCHELL, Denningite, a new tellurite mineral from Moctezuma, Sonora, Mexico. *Canadian Mineral.* 7, 340–341 (1961) (abs.).

The mineral occurs as colorless to pale green platy masses and rarely as small euhedral crystals, which are thin plates, octagonal in outline. It is associated with Te, tellurite, partellurite and several new tellurites, especially spiroffite. Preliminary data on the mineral were given in *Am. Mineral.* 45, 1201 (1961).

Analysis on 500 mg gave TeO_2 82.34, ZnO 2.63, MnO 10.28, CaO 4.23, MgO 0.20, Cd 0.02, Pb 0.01, CoO 0.04, excess O_2 0.09, H_2O 0.03, insol. 0.03, Al, Fe, Sb, Ni, V, Ti, Na, K none, sum 99.90%, corresponding to $(\text{Mn}_{0.56} \text{Ca}_{0.03} \text{Zn}_{0.12} \text{Mg}_{0.02}) \text{Te}_{2.01} \text{O}_{6.02}$ or $(\text{Mn}, \text{Ca}, \text{Zn})\text{Te}_2\text{O}_6$.

The mineral is tetragonal, space group $P4_2/nbc$ with a 8.78 ± 0.05 , c 12.99 ± 0.05 Å, $Z = 8$. Strongest lines are 4.40 (s), 3.36 (s), 3.11 (ms), 2.61 (ms), 2.02 (ms). The mineral is uniaxial (+) with ω 1.89, ϵ 2.00. Some specimens show small $2V$ up to 15° . Luster adamantine, H 4, G 5.05.

The name is for Reynolds M. Denning, Professor of Mineralogy, The Univ. of Michigan.

Paxite

Z. JOHAN, Paxite— Cu_2As_3 , a new copper arsenide from Černý Důl in the Giant Mts. (Krkonoše). *Acta Univer. Carolinae, Geologica*, 1961, (2), 77–86 (1962) (in Czech, with Russian and English abstracts).

The mineral occurs with arsenic, arsenolamprite, silver, loellingite, niccolite, koutekite, novákite, chalcocite, skutterudite, bornite, chalcopyrite, tiemannite, clausthalite, unaninite, hematite and fluorite as local inclusions in calcite veins which are in pyroxenic gneisses and muscovitic mica schists at Černý Důl in Krkonoše (Giant Mts.), Bohemia. It is intergrown with novákite, koutekite and especially with arsenic.

It is light steel-gray on a fresh surface, but soon turns dark and finally becomes black. Luster on a fresh surface metallic, streak black. It has a perfect cleavage in one direction. H $3\frac{1}{2}$ –4. G 5.3 (G 4.5 was determined on samples where paxite is intergrown with arsenic; planimetric analyses were used to determine the ratio of arsenic to paxite; the value 5.3 is very approximate and represents the gravity of paxite after subtraction of arsenic).

In reflected light the mineral is white but appreciably grayer than arsenic. Reflectivity is very slightly lower than that of arsenic. No reflection pleochroism and no internal reflections could be observed, even in oil immersion. Very strongly anisotropic, with light green-gray and dark brown (with a distinct tint of violet) color effects in marginal positions. In crossed nicols grains display a strongly lamellar structure. Can be polished easily. Etched by $\text{HNO}_3(1+1)$ solution; partly positive, partly negative results obtained with 20% FeCl_3 solution, negative with $\text{HCl}(1+1)$, 40% KOH , and 5% HgCl_2 .

Spectrographic analysis of a gel decomposition structure which contains paxite and arsenic in a volume ratio of 1:1 showed Cu, As major (>10%), Ca, Sb minor (1%–0.1%),

Si, Na, Be, Ag, Mg, small, Fe, Al, Sr, Ti, Hg, Bi, Pb, Co, Ni traces. The Ca, Si, Na, Be, Mg, Al, Sr, Mn are attributed to admixed non-ore minerals, the Sb in part to arsenic and probably to paxite. The same material was used for a chemical analysis. "The ascertainment of the conservation of the ratio of paxite to arsenic of 1:1 made it possible to analyze the material of this character for its copper content (copper accompanying paxite only) and arrive thus at the formula of the new mineral; content of Cu in the analyzed sample 18.15% content of Cu referred to 100% paxite 35.77%, (theoretical content of Cu in Cu_2As_3 36.12%)."

The x-ray powder photograph resembles those of substances with the structure of the type Sb_2S_3 and is indexed on that basis, giving an orthorhombic cell with a 12.84, b 11.50, c 7.654 Å, $a:b:c$ 1.116:1:0.6555, $Z=10$, G (calc.) 5.14. The strongest lines are 3.825 (6) (002), 3.633 (8) (012), 3.164 (10) (212), 2.772 (7) (312), 2.618 (7) (240), 1.882 (6) (014), 1.795 (7) (124), 1.202 (7).

The name is based on the Latin pax—peace.

DISCUSSION.—This is the third new mineral—copper arsenide—described from the Černý Důl in the past five years. In papers on koutekite [*Nature* 181 (No. 4622), 1553–1554, (1958); *Chem. Erde*, 20, 217–226, (1960)] and novákite [*Am. Mineral.* 46, 885–891, (1961)] this mineral was spoken of as "mineral X."

FRANTIŠEK ČECH

Unnamed

J. L. JAMBOR, Sulphosalts from Madoc, Ontario. *Canadian Mineral.* 7, 339–340 (1962) (abs.).

A new sulfosalts is the Sb analogue of dufrenoyite, with composition $\text{Pb}_2(\text{Sb}, \text{As})_2\text{S}_6$. Analysis gave Pb 50.6 (av. of 4), S 20.2% (av. of 2). The x-ray pattern is close to that of dufrenoyite with strongest lines 3.82 (10), 3.03 (8), 3.27 (7), 2.76 (6). The mineral is steel-gray, streak black, luster metallic, fracture conchoidal. H $2\frac{1}{2}$, G (pycnometer) 5.919. White in reflected light, with moderately strong anisotropism. Etch tests: HgCl_2 , FeCl_3 , KCN, HCl, negative; KOH, HNO_3 positive.

The mineral occurs in coarse-grained carbonate rocks, from Madoc, Ontario, associated with pyrite, arsenopyrite, sphalerite, cuprian jamesonite, tetrahedrite, arsenian boulangerite, bournonite, and several other Pb-Sb sulfosalts, of which at least three are new. One is the Sb analogue of sartorite, another is tentatively identified as the Sb analogue of baumhauerite.

Unnamed

A. D. DRUMMOND, J. TROTTER AND R. M. THOMPSON, Sulphosalts from Alice Arm, British Columbia. *Canadian Mineral.* 7, 338 (1962) (abs.).

The mineral occurs as very fine needles and small compact masses in quartz veins cutting altered quartz diorite and granodiorite. It is associated with galena, sphalerite, pyrite, molybdenite, tetrahedrite, cosalite, aikinite and an unknown Pb-Bi-Cu sulfosalts. The composition is $(\text{Cu}, \text{Ag})_2\text{S} \cdot 7\text{PbS} \cdot 3\text{Bi}_2\text{S}_3$. Monoclinic, space group $C2$, Cm , or $C2/m$, a 37.5, b 4.07, c 41.6, $\text{all} \pm 0.1$ Å, β 96.8°. G 7.02 ± 0.1 .