

NEW MINERAL NAMES

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Zircosulfate

YU, L. KAPUSTIN, Zircosulfate, a new mineral: *Zapiski Vses. Mineralog. Obshch.* **94**, 530-533 (1965) (in Russian)

Analysis by A. V. Bykova gave ZrO_2 35.30, SO_3 43.80, H_2O^+ 19.00, H_2O^- 1.75, sum 99.85%. Quantitative spectrographic analysis showed HfO_2 1.02% and traces of Ti, Ba, Fe, Zn, Ca and Co. The formula obtained is $Zr(SO_4)_2 \cdot 4H_2O$. The mineral is easily soluble in cold water. DTA analysis by N. S. Gorokhova showed endothermal breaks at 170-200° (corresponding to loss of $3H_2O$), at 295-325° (loss of $1H_2O$), and at 740° (decomposition to cubic ZrO_2).

X-ray powder data by N. G. Pinevich agree closely with those in the ASTM file for synthetic $Zr(SO_4)_2 \cdot 4H_2O$. The strongest lines are 4.33 (10), 2.98 (9), 2.33 (6), and 6.50 (4). The synthetic compound has been described as orthorhombic, space group $D^{24}_{2h}-Fddd$, a 25.92, b 11.62, c 5.532 Å.

Colorless or white with dull luster, H $2\frac{1}{2}$ -3, G 2.85. Optically biaxial, 2V 75°, ns α 1.620, β 1.644 (calc.), γ 1.674. Synthetic material has G 2.83, 2V 70°, biaxial (+), ns α 1.618, β 1.646, γ 1.676.

The mineral occurs as compact, powdery masses in filling a cavity 2 cm in diameter in nepheline syenite pegmatite of the Korgeredabin alkalic massif, southeastern Tuva. The mineral is surrounded by a crust consisting of zirconium hydroxide. Particles of the mineral are 0.01-0.03 mm in size, and have rounded forms or rhombic sections. Associated minerals are hisingerite, smithsonite, limonite, and alteration products of eudialyte. It was probably formed by the attack of sulfuric acid solutions (formed by weathering of sphalerite and other sulfides) on eudialyte and other Zr minerals.

The name is for the composition.

Nickelhexahydrate

B. V. OLEINIKOV, S. L. SHVARTSEV, N. T. MANDRIKOVA AND N. N. OLEINIKOVA, Nickelhexahydrate, a new mineral: *Zapiski Vses. Mineralog. Obshch.* **94**, 534-547 (1965) (in Russian)

Analyses of 2 samples gave, resp., NiO 13.90, 22.57; MgO 3.87, 2.82; FeO 6.41, 2.63; CuO 2.14, 0.26; CoO 0.08, 0.03; MnO 0.09, 0.07; ZnO, CaO none; Fe_2O_3 0.68, 0.18; SO_2 30.43, 30.82; H_2O 41.90, 41.05; sum 99.50, 100.04%. These correspond to



Spectrographic analysis by A. D. Glazunova showed traces of Zn, Pb, Ti and Cr.

X-ray powder data are given for both samples. They agree closely and are very similar to those published for hexahydrate ($MgSO_4 \cdot 6H_2O$) and ferohexahydrate ($FeSO_4 \cdot 6H_2O$). The strongest lines (sample 2) are: 4.35 (10), 2.89 (9), 1.994 (8), 3.98 (8), 1.856 (7), 2.27 (6). The mineral is therefore the monoclinic dimorph of tetragonal retgersite. Infrared spectra are also given.

DTA curves show small endothermal breaks at 120° and 420°, a large one at 175-180°. About half the water is lost to 120°, $2H_2O$ at 180°, and the remaining water at 420°. At higher temperatures broad endothermal effects, corresponding to the decomposition of the sulfates, occur in the region 800-900°.

The mineral is bluish-green, luster vitreous, cleavage perfect, probably on {010}, with a second, less perfect, on {100}. G not detd., optic sign and 2V could not be determined; indices of refraction: (sample 1, α 1.469, γ 1.494; sample 2, α 1.470, γ 1.493; $c:Z = 45^\circ$).

The mineral occurs as crusts and coatings in the mine pit of the Severnaya mine, Noril'sk deposits, USSR.

Sedovite

K. V. SKVORTSOVA AND G. A. SIDORENKO, Sedovite, a new supergene mineral of uranium and molybdenum: *Zapsiki Vses. Mineralog. Obsch.* **94**, 548–554 (1965) (in Russian)

Microchemical analysis by N. N. Kuznetsova of a mixture with gypsum and a little molybdenite gave UO_2 4.16, UO_3 none, MoO_3 5.50, CaO 27.89, SO_3 41.51, H_2O^+ 19.72, Fe_2O_3 0.17, SiO_2 0.60, sum 99.55%. Subtracting all the CaO , SO_3 , and H_2O as gypsum and molybdenite (27% of the Mo), the remainder corresponds to $\text{UO}_2:\text{MoO}_3=1:2$. Partial analysis of another sample containing molybdenite and hydromica gave UO_2 31.05, MoO_3 40.83 also gave the ratio 1:2, after subtracting 23% of the Mo as molybdenite. The formula is therefore tentatively $\text{U}(\text{MoO}_4)_2$. Soluble in conc. HCl , HNO_3 , and H_2SO_4 only with difficulty, on boiling.

Indexed x-ray powder data for fine acicular and powdery material agree well. The strongest lines for the fine acicular are 3.193 (10) (110,002), 11.04 (9) (010), 3.370 (9) (100), 3.064 (9) (012), 5.530 (8) (030), 2.775 (6) (040,022), 2.559 (6) (041). The data were indexed by the Ito method as showing orthorhombic symmetry (possibly monoclinic) with a 3.36 ± 0.06 , b 11.08 ± 0.03 , c 6.42 ± 0.05 Å.

Color brown to reddish-brown. G 4.2 (by immersion in heavy liquids). Hardness 105 kg/sq mm = 3.3 on the Khrushchev scale. One cleavage parallel to the elongation. Optically biaxial with indices of refraction above 1.789. Nearly opaque. Slightly pleochroic, Z reddish-brown, X and Y paler reddish-brown. Elongation positive, extinction angle γ :elongation = 38° . In reflected light gray with brownish tint, reflecting power 11.8%. Anisotropy very slight and masked by strong red internal reflections.

Sedovite occurs in the supergene zone of a U-Mo deposit (no locality given) as powdery deposits or radiating-fibrous bundles of crystals, tenths to hundredths of a mm, on altered pitchblende and femolite (*Am. Mineral.* **50**, 261). It is closely associated with wulfenite. It also occurs within large platy crystals of gypsum. The mineral mourite (*Am. Mineral.* **44**, 1217) forms on sedovite.

The name is for the Russian Polar investigator T. Ya Sedov.

DISCUSSION:—Appears to be a valid mineral, but needs further study.

Magbasite

E. I. SEMENOV, A. P. KHOMYAKOV AND A. V. BYKOVA, Magbasite, a new mineral: *Doklady Akad. Nauk SSSR* **163**(3), 718–719 (1965) (in Russian)

Analysis (by A. V. B.) on 30 mg gave SiO_2 39.7, Al_2O_3 4.0, Sc_2O_3 2.1, FeO 8.9, MgO 21.4 CaO 1.7, BaO 14.8, K_2O 4.9, F 5.5, sum 103.0—($\text{O}=\text{F}_2$) 2.3 = 100.7%. This corresponds to $\text{KBa}(\text{Al},\text{Sc})(\text{Mg},\text{Fe}^{2+})_6\text{Si}_6\text{O}_{20}\text{F}_2$. Spectrographic analysis by N. V. Lizunov showed the presence of In, Sn, Mn, and traces of Pb, W, Mo, V.

X-ray powder data are given (50 lines); the strongest are 3.63 (10), 3.23–3.16 (10,b), 2.59 (8), 2.43 (8), 1.407 (7), 1.163 (7), 9.47 (5), 3.01 (5), 2.83 (5), 1.614 (5). Attempts to obtain a Laue diagram failed.

The mineral forms fan-shaped fine acicular and felt-like deposits up to 0.5 cm in size, somewhat resembling tremolite. Colorless or rose-violet, luster vitreous, H about 5, G 3.41. Optically biaxial (–), α 1.597, β 1.609, γ 1.615, $2V$ 70° , $c:Z=10^\circ$. Pleochroic, colorless on X and Y, lilac on Z.

The mineral occurs in "one of the Asiatic hydrothermal formations," associated with fluorite, barite, and parisite, genetically associated with alkalic barkevitic granosyenites

occurring in dolomites. Under surface conditions the mineral alters to a brown ocherous mass (limonite?).

The name is for the composition.

Volynskite

M. S. BEZSMERTNAYA AND L. N. SOBOLEVA, Volynskite, a new telluride of bismuth and silver: *Akad. Nauk SSSR, Eksperimental'no Metod. Issled. Rudnykh Mineralov*, Moscow, 1965, 129–141 (in Russian).

A preliminary report, without a name, was abstracted in *Am. Mineral.* **49**, 818 (1964). Additional data are as follows: Microspectrographic analyses were made by N. V. Korolev, using hessite and tellurobismuthite as standards, leading to the formula $\text{Ag Bi}_{1.16}\text{Te}_2$ (details not given).

X-ray powder data for the natural mineral (24 lines) agree well with those for the low-temperature modification of synthesized AgBiTe_2 which is orthorhombic. Strongest lines of the natural mineral are 3.09 (10), 3.21 (8), 2.21 (5), 2.15 (3), 1.82 (3). Optical data are given; the mineral is not as bright as tellurobismuthite, but is brighter than galena. It has a pale purplish color in a reflected light. Anisotropic in hardness, range 55–99 kg/sq mm.

A mineral very similar to volynskite in optical properties was observed from a gold deposit in Eastern Sayan.

The name is for I. S. Volynskii, 1900–1962, former director of the mineragraphic laboratory, Institute of Mineralogy, Geochemistry, and Crystal Chemistry of Rare Elements, Moscow.

DISCUSSION:—The x-ray data suggest a possible relation to emplectite.

Imhofite

G. BURRI, S. GRAESER, F. MARUMO AND W. NOWACKI, Imhofit, ein neues Thallium-arseno-sulfosalz aus dem Lengenbach (Binnatal, Kanton Wallis): *Chimia* (Switzerland) **19**, 499–500 (1965).

The mineral was found as thin translucent copper-red plates (size about $0.06 \times 0.03 \times 0.001$ mm) and aggregates. Weissenberg and precession photographs showed it to be monoclinic, space group $P2_1$ or $P2_1/m$, a 8.77 ± 0.02 , b 24.51 ± 0.03 , c $11.44 \pm 0.03 \text{ \AA}$, β $107 \pm 1^\circ$. The x-ray powder pattern is not given but is stated to differ from those of known As-containing sulfosalts. Very soft; Vickers hardness 38 (galena 71–77). Reflecting power in air with green light 31–28%. Color in reflected light pure white, somewhat cream-colored compared to galena. Anisotropy very strong; strong bright-red internal reflections.

Electron probe microanalysis gave Tl 33.6, Cu 1.67, As 30.2, S 33.7, total 99.17%; the analysis was difficult because the mineral on long illumination in the electron beam “exploded” into many splinters. The density could not be determined; cell contents are calculated for various assumed densities as follows:

G	Tl	Cu	As	S
4.5	5.23	0.84	12.82	33.43
5.0	5.81	0.93	14.24	37.14
5.5	6.39	1.03	15.67	40.86
6.0	6.97	1.12	17.09	44.57
6.5	7.55	1.21	18.52	48.29
7.0	8.14	1.31	19.94	52.00

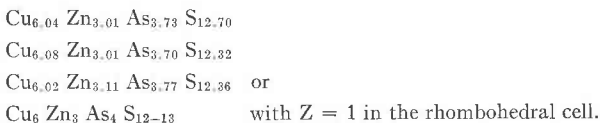
The name is for Josef Imhof, strahler (professional mineral collector), of Binn, Switzerland.

DISCUSSION:—Probably a valid mineral, but needs a density determination. The x -ray powder data should be published.

Nowackiite

F. MARUMO AND G. BURRI, Nowackiite, a new copper zinc arsenosulfosal from Lengenbach (Binnatal, Kanton Wallis): *Chimia* (Switzerland) **19**, 500–501 (1965).

The mineral was found as about 10 lead-gray to black crystals (up to 0.3 mm in size) on a honey-yellow sphalerite crystal on dolomite from the well-known Lengenbach locality. It was thought to be binnite but an x -ray powder photograph (data not given) showed a strong relation to the sphalerite structure. Oscillation and Weissenberg photographs showed it to be rhombohedral ($R\bar{3}$ or $R3$) with a (rh) 8.34 ± 0.01 Å, α $107^\circ 20' \pm 10'$; in hexagonal setting a 13.44 ± 0.015 , c 9.17 ± 0.01 Å, $c/a = 0.682$. Three microprobe analyses (1. by G. Burri, 2. by C. Bahezze on the same crystal, 3. by G. Burri on a different crystal) gave Cu 31.2, 21.0, 30.9; Zn 15.9, 15.9, 16.4; As 22.4, 22.6, 22.8; S 31.9, 32.9, 32.0; sum 101.4, 102.4, 102.1%. The density was not determined. Assuming a density of 4.3, the 3 analyses give



The name is for Professor Werner Nowackii, Univ. Berne.

DISCUSSION:—Needs further study. The x -ray powder data should be published.

Wallisite

WERNER NOWACKI, Über einige Mineralfunde aus dem Lengenbach (Binnatal, Kt. Wallis): *Eclogae Geol. Helveticae* **58**, 403–406 (1965).

A preliminary account. The mineral occurs at the well-known Lengenbach locality as an overgrowth on rathite-I. Electron-probe microanalysis by C. Bahezze gave Tl 25.8, Pb 25, Cu 7.5, Ag 2.7, As 20.8, S. 18.6, sum 100.4%. The mineral is triclinic, $P1$ or $P\bar{1}$, with reduced cell a 9.21₅, b 8.52₄, c 7.76 Å, α $121^\circ 32'$, β $100^\circ 54'$, γ $110^\circ 36'$, cleavage (001) good. G and H not given.

Further study is under way.

The name is resumably for Canton Wallis.

DISCUSSION:—Data inadequate. The analysis gives nearly (Cu, Ag)TlPbAs₂S₄ with unit cell content of 1 molecule for $G = 3.0$.

Berryite

E. W. NUFFIELD AND D. C. HARRIS, a new sulpho-salt mineral: *Canadian Mineralogist*, **8**, 400 (1965) (abstract).

A new sulphosalt mineral has been found on the type specimen of cuprobismuthite from Park County, Colorado, and on specimens from the Nordmark mines, Sweden. The mineral occurs as lath-like crystals up to one millimeter in length.

The structural cell is monoclinic with $a = 12.72$, $b = 4.02$ (axis of elongation), $c = 58.07$, $\beta = 102\frac{1}{2}^\circ$. A pronounced pseudo-cell has $a' = a/3 = 4.24$, $b' = b = 4.02$, $c' = c/2 = 29.04$, $\beta = 102\frac{1}{2}^\circ$. The calculated density is 7.11 compared to a measured value of 6.7 corrected for an estimated 10 per cent quartz contamination.

On the basis of the unit cell data, density determinations and x -ray spectrographic analyses, the most likely cell contents are: $\text{Pb}_{12}(\text{Cu,Ag})_{18}\text{Bi}_{30}\text{S}_{66} = 6[\text{Pb}_2(\text{Cu,Ag})_3\text{Bi}_5\text{S}_{11}]$.

The name is for Professor L. G. Berry, eminent Canadian mineralogist. It was approved before publication by the Commission on New Minerals and Mineral Names, I.M.A.

J. A. MANDARINO

Fairbanksite

FRENCH MORGAN, Unusual mineral locality at Greenbelt, Maryland: *Rocks and Minerals*, 40(8), 586-587 (1965).

Microscopic crystals in shrinkage cracks of concretions are named for Dr. E. E. Fairbanks, formerly mineralogist of the U. S. Bureau of Mines, who discovered the occurrence in 1941. Goethite, rockbridgeite, beraunite, quartz and opal are stated to have been identified in similar concretions from this locality. No data whatever are given; it is hinted that the mineral may resemble the phosphate azovskite.

DISCUSSION:—The name has no standing, and its publication is not only a disservice to mineralogy, but no compliment to the person whose name was thus used.

Two unnamed minerals

J. A. MANDARINO, D. C. HARRIS AND J. BRADLEY, Mangan-neptunite, epididymite, and new species from Mont St. Hilaire, Quebec: *Canadian Mineralogist* 8, 398 (1965) (abstract).

I. Spectrographic and other tests indicate that the mineral is a carbonate of Ca, Sr and rare earths. Orthorhombic, space group $Pmmm$, a 7.24, b 8.49, c 50.2 Å. Cleavage prismatic, perfect. The x -ray pattern is distinct from those of chemically similar minerals. Strongest lines 4.31 (10), 2.935 (9), 5.51 (8), and 2.330 (7). Color pink to lilac, G 4.15. Optically biaxial (—), $2V$ 90° (86° calc.), n_s α 1.680, β 1.725, γ 1.768, $X=a$, $Y=b$, high dispersion of the optic axes. Occurs as well-formed single crystals and as intergrown radiating groups.

II. A second possibly new species is a calcium potassium zirconium silicate, occurring as small brown pseudohexagonal crystals. Monoclinic, space group $P2_1/a$, a 12.24, b 10.57, c 8.06 Å, β $101^\circ 10'$; strongest lines are 3.16 (10), 6.02 (9), 5.28 (7), 3.05 (7), 3.00 (5). G 2.68. Optically biaxial, n_s α 1.593, γ 1.608.

Unnamed

D. C. HARRIS AND E. W. NUFFIELD, A copper telluro-selenide from Moctezuma, Mexico: *Canadian Mineralogist*, 8, 397 (1965) (abstract).

A copper telluro-selenide has been found associated with klockmannite, native selenium, native tellurium, chalcomenite, tellurite, and paratellurite. It resembles klockmannite in color, luster and hardness. The mineral is tetragonal with $a=5.46$, $c=5.63$ Å, and a cubic ZnS type structure. Strongest x -ray powder lines are: 3.19 (10), 1.961 (7), 1.931 (4), and 1.653 (5).

J. A. MANDARINO

NEW DATA

Rhodizite

CLIFFORD FRONDEL AND JUN ITO, Composition of rhodizite. *Tschermaks Mineral. Pet. Mitt.* (3) 10, 409-412 (1965).

A new chemical analysis made from 5 grams of clear crystal fragments from Manjaka, Madagascar, yielded: Na₂O 0.12, K₂O 1.79, Rb₂O 1.83, Cs₂O 7.54, BeO 12.20, Al₂O₃ 24.41, Fe₂O₃ 0.12, B₂O₃ 46.82, SiO₂ 0.45, ign. loss 4.10, rem. 0.53, sum 99.92%; rem. is Li₂O 0.00x,

SnO_2 0.1, H_2O —0.53. This corresponds to the new formula $\text{CsAl}_4\text{Be}_4\text{B}_{11}(\text{OH})_4\text{O}_{28}$, with substitution of alkalis corresponding to $\text{Cs}:\text{Rb}:\text{K}:\text{Na}=2.7:1:1.9:0.2$. Space group $P\bar{4}3m$ is confirmed, a 7.317 ± 0.001 , density 3.44 ± 0.01 (meas.), 3.47 (calc.), $Z=1$; n 1.693 ± 0.001 (Na); $H=8\frac{1}{2}$. The cell dimensions of rhodizite from three other Malagasy localities are identical. The most recent (STRUNZ, *Naturwiss.* 26, 217, 1938) of various formulas formerly assigned to rhodizite was $\text{KNaLi}_4\text{Al}_4(\text{Be}_3\text{B}_{10}\text{O}_{27})$.

A. PABST

Attakolite (Attacolite)

O. GABRIELSON AND PER GEIJER, The mineral attakolite. *Arkiv Mineral. Geol.* 3 (30), 537–543 (1964).

Attakolite was named by C. W. Blomstrand (*Öfv. K. Vet. Akad. Förh.* 25, 197, 1868). The validity of the species had been questioned. The abundant type material from Västana, southernmost Sweden, has been reexamined and the validity of the species fully confirmed. A new chemical analysis by R. Blix on material considered to be contaminated with 1.30% calcite and 0.76% svanbergite, yielded: P_2O_5 32.59, SiO_2 9.35, Al_2O_3 26.97, Fe_2O_3 0.60, MgO 0.29, FeO 1.31, MnO 7.10, Na_2O 0.03, CaO 11.40, SrO 3.30, PbO 0.03, $\text{H}_2\text{O} < 105^\circ$ 0.20, $\text{H}_2\text{O} > 105^\circ$ 5.92, F 0.10, Cl 0.06, SO_3 0.13, CO_2 0.57, total 99.95, —O for F, Cl 0.06, adjusted total 99.89; density 3.229. The optical properties previously reported on a “specimen of uncertain authenticity” (*Dana's System*, 7th ed., vol. II, 845, 1951) were largely confirmed; biaxial (+), α 1.655, β 1.664, γ 1.675, $2V$ 84° . A Guinier x -ray powder diffraction pattern is indexed on an orthorhombic cell with a 11.38, b 13.22, c 14.08 Å. The analysis is interpreted as corresponding to $(\text{X})_3(\text{Y})_6(\text{ZO}_4)_{7-m}(\text{OH})_{4m} \cdot 3\text{H}_2\text{O}$, where $\text{X} = \text{Ca}, \text{Mn}^{2+}, \text{Sr}$; $\text{Y} = \text{Al}, \text{Fe}^{3+}, \text{Fe}^{2+}, \text{Mg}, \text{Mn}^{3+}$; $\text{Z} = \text{P}, \text{Si}$ (and possibly some Al). The cell contains four formula units. A dehydration curve is reported. The water is lost gradually between 500 and 710° C. At the higher temperature the structure is still intact but at 850° C. it is completely destroyed.

A. PABST

Hellandite

IVAR OFTEDAL, Über den Hellandit. *Tschermaks Mineral. Pet. Mitt.*, (3) 10, 125–129 (1965).

After it was shown that hellandite is a borosilicate (IVAR OFTEDAL, On the chemical composition of hellandite. *Norsk Geol. Tidsskr.* 44, 35–37, 1964; *Am. Mineral.* 50, 812, 1965) X -ray powder patterns of altered and “fresh” hellandite proved to be identical and a new chemical analysis of altered hellandite yielded the following results: SiO_2 26.65, Al_2O_3 2.58, TiO_2 0.39, Fe_2O_3 3.07, FeO 0.07, MnO 0.41, MgO 0.60, CaO 11.51, R_2O_3 38.73, B_2O_3 10.5, $\text{H}_2\text{O} +$ 3.75, $\text{H}_2\text{O} - (105^\circ \text{C})$ 1.85, sum 100.11 (B. Bruun analyst). The principal components of R_2O_3 are: Y_2O_3 21.68, Yb_2O_3 4.05, Dy_2O_3 2.84, Er_2O_3 2.75, Gd_2O_3 1.66, ThO_2 1.46, all others below 1%. Assuming that Al, Fe, Mg, Mn, Ti and some H_2O and SiO_2 are impurities, the formula $\text{Ca}_3(\text{Y}, \text{Yb} \dots)_4\text{B}_4\text{Si}_6\text{O}_{27} \cdot 3\text{H}_2\text{O}$ is proposed. The three strongest lines of an unindexed x -ray powder pattern of 11 lines are: 2.63 (10), 2.82 (6), 1.89 (6).

A. PABST