NEW MINERAL NAMES

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Zircosulfate


Analysis by A. V. Bykova gave ZrO₂ 35.30, SO₄ 43.80, H₂O 19.00, H₂O⁻ 1.75, sum 99.85%. Quantitative spectrographic analysis showed HfO₂ 1.02% and traces of Ti, Ba, Fe, Zn, Ca and Co. The formula obtained is Zr(SO₄)₂·4H₂O. The mineral is easily soluble in cold water. DTA analysis by N. S. Gorokhova showed endothermal breaks at 170–200° (corresponding to loss of 3H₂O), at 295–325° (loss of 1H₂O), and at 740° (decomposition to cubic ZrO₂).

X-ray powder data by N. G. Pinevich agree closely with those in the ASTM file for synthetic Zr(SO₄)₂·4H₂O. 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 D₂h2-Fddd, a 25.92, b 11.62, c 5.532 Å.

Colorless or white with dull luster, H 2½–3, 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 alkali 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.

Nickelhexahydrite


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; Fe₂O₃ 0.68, 0.18; SO₄ 30.43, 30.82; H₂O 41.90, 41.05; sum 99.50, 100.04%. These correspond to (Ni₀.₉₉,Mg₀.₀₉,Fe₀.₃₆,Cu₀.₀₁)(SO₄)₀.₉₉·5.98H₂O and (Ni₀.₇₇,Mg₀.₈₃,Fe₀.₁₀)(SO₄)₀.ₙ₉·5.₈₄H₂

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 hexahydrite (MgSO₄·6H₂O) and ferrohexahydrite (FeSO₄·6H₂O). 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°, 2H₂O 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 {1010}, 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°.
The mineral occurs as crusts and coatings in the mine pit of the Severnaya mine, Noril'sk deposits, USSR.

**Sedovite**


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$_2$O$^+$ 19.72, Fe$_2$O$_3$ 0.17, SiO$_2$ 0.60, sum 99.55%. Subtracting all the CaO, SO$_3$, and H$_2$O as gypsum and molybdenite (27% of the Mo), the remainder corresponds to UO$_2$·MoO$_3$=1:2. Partial analysis of another sample containing molybdenite and hydroxymica 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 U(MoO$_3$)$_2$. Soluble in conc. HCl, HNO$_3$, and H$_2$SO$_4$ 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.


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, 267). 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**


Analysis (by A. V. B.) on 30 mg gave SiO$_2$ 39.7, Al$_2$O$_3$ 4.0, Sc$_2$O$_3$ 2.1, FeO 8.9, MgO 21.4 CaO 1.7, BaO 14.8, K$_2$O 4.9, F 5.5, sum 103.0 = (O=F=) 2.3 = 100.7%. This corresponds to KBa(Al,Sc)(Mg,Fe$^{2+}$)$_6$Si$_6$O$_{24}$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°. Pleochroic, colorless on X and Y, lilac on Z.

The mineral occurs in “one of the Asiatic hydrothermal formations,” associated with fluorite, barite, and parsite, genetically associated with alkaline barkevitic granosyenites
occurring in dolomites. Under surface conditions the mineral alters to a brown ocherous mass (limonite?).

The name is for the composition.

Volynskite


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 Ag Bi_{1.6}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 mineralographic laboratory, Institute of Mineralogy, Geochemistry, and Crystal Chemistry of Rare Elements, Moscow.

Discussion:—The x-ray data suggest a possible relation to emplaceite.

Imhofite


The mineral was found as thin translucent copper-red plates (size about 0.06X0.03X0.001 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±0.03 Å, β 107±1°. 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 31.280/6. 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:

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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 arsenosulfosalt 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 (R3 or R3) with a (rh) 8.34±0.01 Å, c 107°20′±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. Baherze 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

\[
\begin{align*}
\text{Cu}_{6.91} \text{Zn}_{0.01} & \text{As}_{3.73} \text{S}_{12.70} \\
\text{Cu}_{6.88} & \text{Zn}_{0.01} \text{As}_{3.70} \text{S}_{12.72} \\
\text{Cu}_{6.92} & \text{Zn}_{0.11} \text{As}_{3.27} \text{S}_{12.36} \\
\text{Cu}_{6} & \text{Zn}_{2} \text{As}_{4} \text{S}_{12.42}
\end{align*}
\]

with Z = 1 in the rhombohedral cell.

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

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

Wallisite


A preliminary account. The mineral occurs at the well-known Lengenbach locality as an overgrowth on rathite-I. Electron-probe microanalysis by C. Baherze gave Ti 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 PT, with reduced cell a 9.21, b 8.52, c 8.76, a = 121°32′, β 100°54′, γ 110°36′, cleavage (001) good, G and H not given.

Further study is under way.

The name is presumably for Canton Wallis.

DISCUSSION:—Data inadequate. The analysis gives nearly (Cu, Ag)TiPbAsS4, with unit cell content of 1 molecule for G = 3.0.

Berryite


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, β = 102°24′. A pronounced pseudo-cell has a' = a/3 = 4.24, b' = b = 4.02, c' = c/2 = 29.04, β' = 102°24′. 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: Pb12(Cu,Ag)4Bi6S36 = 6Pb2(Cu,Ag)2BiS11.
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


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


I. Spectrographic and other tests indicate that the mineral is a carbonate of Ca, Sr and rare earths. Orthorhombic, space group Pmmn, 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 909 (86° calc.), ω 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 P21/a, a 12.24, b 10.57, c 8.06 Å, β 101°10'; strongest lines are 3.16 (10), 6.02 (9), 5.28 (7), 3.05 (7), 3.00 (5). G 2.68. Optically biaxial, ω 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


A new chemical analysis made from 5 grams of clear crystal fragments from Manjakaminto, Madagascar, yielded: Na$_2$O 0.12, K$_2$O 1.79, Rb$_2$O 1.83, Cs$_2$O 7.54, BeO 12.20, Al$_2$O$_3$ 24.41, Fe$_2$O$_3$ 0.12, B$_2$O$_3$ 46.82, SiO$_2$ 0.45, ign. loss 4.10, rem. 0.53, sum 99.92%; rem. is Li$_2$O 0.00x,
This corresponds to the new formula CsAlBe$_2$B$_3$(OH)$_6$O$_8$, with substitution of alkalis corresponding to Cs:Rb:K:Na=2.7:1:1.9:0.2. Space group $P4_3m$ 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=8½. 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 KNaLiAl$_3$(Be$_2$B$_3$O$_{12}$).

A. PæBst

**Attakolite (Attacolite)**


Attakolite was named by C. W. Blomstrand (Öf. K. Vet. Akad. Förh. 25, 197, 1868). The validity of the species had been questioned. The abundant type material from Västnä, 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% vanbergite, yielded: P$_2$O$_5$ 32.59, SiO$_2$ 9.35, Al$_2$O$_3$ 26.97, Fe$_3$O$_4$ 0.60, MgO 0.29, FeO 1.31, MnO 7.10, Na$_2$O 0.03, CaO 11.40, SrO 3.30, PbO 0.03, H$_2$O$<10^5$ 0.20, H$_2$O$>10^5$ 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 α 11.38, b 13.22, c 14.08 Å. The analysis is interpreted as corresponding to (X)$_5$(Y)$_6$(Z$_{18}$=15−$\delta$)(OH)$_{13}$·3H$_2$O, where X=Ca, Mn$^{2+}$, Sr; Y=Al, Fe$^{3+}$, Fe$^{2+}$, Mg, Mn$^{3+}$; Z=P, 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. PæBst

**Hellandite**


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$_2$O$_3$ 2.58, TiO$_2$ 0.39 Fe$_2$O$_3$ 3.07, FeO 0.07, MnO 0.41, MgO 0.60, CaO 11.51, R$_2$O$_3$ 38.73, B$_2$O$_3$ 10.5, H$_2$O + 3.75, H$_2$O$−$ (105° C) 1.85, sum 100.11 (B. Brunø analyst). The principal components of R$_2$O$_3$ are: Y$_2$O$_3$ 21.68, Yb$_2$O$_3$ 4.05, Dy$_2$O$_3$ 2.84, Er$_2$O$_3$ 2.75, Gd$_2$O$_3$ 1.66, Th$_2$O$_3$ 1.46, all others below 1%. Assuming that Al, Fe, Mg, Mn, Ti and some H$_2$O and SiO$_2$ are impurities, the formula Ca$_9$Y$_2$Fe$_{3+}$Mn$^{2+}$Ti$_{4+}$H$_2$O$_{17}$SiO$_3$ 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. PæBst