NEW MINERAL NAMES

Fleischerite, Itoite

C. Frondel and H. Strunz. Fleischerit und Itoit, zwei neue Germanium-Mineralien von Tsumeb. *Neues Jahrb. Mineral., Montash.* **1960,** 132–142 (English summary).

The minerals were found in the upper oxidation zone of the Tsumeb Mine, associated with cerussite, mimetite, and altered tennantite, also as a crust on plumbojarosite and mimetite on dolomite. A preliminary description of fleischerite (unnamed) was given by Frondel and Ito in *Am. Mineral.* **42,** 747 (1957).

Fleischerite occurs as white to pale rose fibrous aggregates, with silky luster. Analysis by Jun Ito gave PbO 63.34, GeO 8.18, Ga_2O_3 0.86, Fe_2O_3 0.05, SO_3 15.06, H_2O^+ 11.35, H_2O^- 0.21, insol. 0.56, sum 99.61%, corresponding to $Pb_3Ge^{+2}(OH)_4(SO_4)_2 \cdot 4H_2O$.

Oscillation, rotation, and Laue photographs show fleischerite to be hexagonal, space group probably $P6_3/mmc$, a_0 8.89, $c_0$10.86 Å. $Z=2$. Indexed x-ray powder data are given; the strongest lines are 3.619 (10), 2.635 (8), 3.437 (6), 2.214 (6), 1.889 (6). No cleavage was observed.

G. 4.2–4.4 (measured), 4.59 (calcd.) Hardness low.

Optically uniaxial, pos., *ns* ϵ 1.776, ω 1.747. Not fluorescent under UV light, becomes rose-violet when irradiated with x-rays.

DTA study showed a distinct endothermal effect at 263°, a weak endothermal effect at 314°, and a small exothermal effect at 463°. When heated and observed under the microscope becomes turbid at 175–200°, inverts to an isotropic phase at 465°. When ground for a long time in an agate mortar, inverts to itoite by loss of water and oxidation of Ge^{+2} to Ge^{+4}.

The name is for Michael Fleischer of the U. S. Geological Survey; the name has also been used for wurtzite-6H (*Am. Mineral.* **36,** p. 639–640 (1951).

Itoite was found as fine-grained pseudomorphs after fleischerite. It has mean n 1.84–1.85. White, luster silky. Qualitative analysis and spectrographic study showed only Pb, Ge, and sulfate. The x-ray powder diagram is identical with that of fleischerite heated at 300° and nearly identical with that of anglesite; the strongest lines are 2.065 (10), 3.326 (9), 3.003 (9), 4.240 (8), 2.027 (8), 3.209 (7). The composition is formulated as $Pb_3[GeO_2(OH)_2](SO_4)_2$, i.e. anglesite with one-third of the (SO_4) replaced by $[GeO_2(OH)_2]$. From the powder data, the unit cell is a 8.47, b 5.38, c 6.94 Å, $Z=4$, G. calcd. 6.67.

The name is for Prof. Tei-ichi Ito, Univ. of Tokyo.

Michael Fleischer

Coesite

E. C. T. Chao, E. M. Shoemaker, and B. M. Madsen. First natural occurrence of coesite. *Science,* **132,** No. 3421, 220–222 (1960).

Coesite, the high-pressure polymorph of SiO_2, was first made by Coes in 1953. The mineral was found as an abundant constituent of the sheared Coconino sandstone at Meteor Crater, Arizona, in the debris under the crater floor and in drill cuttings of breccia from a depth of 600–650 feet, beneath the crater floor. It has also been found in sandstone outside the crater rim, and as a subordinate constituent of glass (lechatelierite) in lake beds in the crater. Coesite occurs in irregular grains 5 to more than 50 microns in size. It has mean index of refraction 1.595 and very low birefringence. Spectrographic analysis of a concentrate containing a little quartz gave more than 99% SiO_2. The x-ray pattern was identical with that of synthetic coesite.

Coesite has since been identified by Chao in samples collected by Shoemaker from the Rieskessel caldera, Bavaria (Pecora, 1960).

The properties of synthetic coesite are as follows: G. 3.01 (Coes), 3.01 (Ramsdell), 2.93±0.02 (Dachille and Roy), calcd. 2.90. Biaxial, positive, 2V 54° (Coes); biaxial, positive, 2V 64° (Boyd and England); biaxial, negative, 2V 61° (Khitarov *et al.*); *ns* α 1.599, γ 1.604 (Coes), α 1.593±0.002, γ 1.597±0.002 (Boyd and England), α 1.594, γ 1.597 (Khitarov et. al.). Hardness (Knoop) 1200 (near Mohs 8) (Coes).

Monoclinic, *a* 7.23, *b* 12.52, *c* 7.23, β 120° (Ramsdell); *a* 7.17, *b* 7.17, *c* 12.38, γ 120.0° (Zoltai and Buerger); *a* 7.16, *b* 12.39, *c* 7.16, β 120° (Dachille and Roy). Powder data are given by Coes, Boyd and England, Khitarov et al., and Dachille and Roy. The strongest lines (average of closely agreeing results by Boyd and England and Dachille and Roy) are 3.10 (100), 3.43 (50), 2.69 (15), 1.698–1.716 (10–15).

Coesite is nearly insoluble in 5% HF at room temperature, but is rapidly dissolved by fused NH_4HF_2. The stability relations and the quartz-coesite transition have been studied by Boyd and England, Dachille and Roy, and MacDonald. An analogous form of BeF_2 has been made by Dachille and Roy.

The name, proposed by Sosman in 1954, is for Loring Coes, Jr., of the Norton Company, who first synthesized it.

References

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MacDonald, G. J. F. (1956) Quartz-coesite stability relations at high temperatures and pressures: *Am. J. Sci.*, **254**, 713–721.

Pecora, W. T. (1960) Coesite craters and space geology: *Geotimes*, **5**, No. 2, 16–17, 32.

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Sosman, R. B. (1954) New high-pressure phases of silica: *Science*, **119**, 738–739.

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M. F.

Nakaséite

Tei-Ichi and Hisashi Muraoka. Nakaséite, an andorite-like new mineral. *Zeits. Krist*, **113**, 93–98 (1960).

Analysis by H. M. gave Ag 9.3, Cu 4.6, Pb 19.8, Fe 0.5, Zn 1.1, Sb 39.4, S 23.4, SiO_2 0.2, (Cr_2O_3) 1.2, sum 99.5%. Spectrographic analysis showed Ag, Pb, Sb, and Cu, with small amounts of Fe, Bi, Sn, and Cd. (Note—the (Cr_2O_3) is not explained and Cr is not mentioned as being found spectrographically. M.F.) After deducting 10% of argentian tetrahedrite (freibergite) and 2% sphalerite, this gives nearly $Pb_4Ag_3CuSb_{12}S_{24}$ (andorite is $Pb(Ag, Cu)Sb_3S_6$).

X-ray study shows the mineral to be monoclinic, *a* 13.02±.04, *b* 19.18±.05, *c* 102.24 (=24×4.26±0.02) Å, β=90°, Z=24($Pb_4Ag_3CuSb_{12}S_{24}$), G. calcd. 5.37₉, G. observed 5.30. The *a* and *b* are essentially identical with those for andorite, but *c*=24×4.26, whereas for andorite IV and andorite VI, it is 4×4.26 and 6×4.26 (Donnay and Donnay, *Am. Mineral.* **39,** 161–171 (1954)). Space group *P*11*a*. Slightly piezoelectric. *X*-ray powder data are given; they are essentially identical with those for andorite.

The mineral is light gray, luster metallic, opaque. Etch tests are given. It occurs in gold-bearing stibnite-quartz veins at the Nakasé Mine, Japan, intimately intergrown with argentian tetrahedrite and sphalerite.

The name is for the mine.

Discussion.—The authors state that the structural data suggest "that nakaséite is no other than a structural variety of andorite. That we propose nevertheless a new mineral name is because, apart from the difference in the chemical compositions, it has a very complicated twinned lattice essentially different from that of andorite."

These reasons for a new name seem unconvincing to me. The alleged chemical differences, based on a difficult analysis of impure material, do not seem significant. At least until these complex structures have been more thoroughly worked out, the material should be called andorite XXIV.

M. F.

Stranskiite

H. Strunz. Stranskiit, ein neues Mineral. *Naturwissenschaften*, **47,** No. 16, 376 (1960).

The mineral occurs as radiating aggregates on chalcocite in the 1000 m. level of the Tsumeb Mine, S.W. Africa. Color cyan-blue. It is triclinic, *a* 5.07, *b* 6.77, *c* 5.28 Å, α 111°, β 113.5°, γ 86°. The unit cell contains $(Zn_{1.73}Fe_{0.05}Mg_{0.09}Ca_{0.10})_{1.97}Cu_{1.07}As_{1.90}Si_{0.10}O_8$, or $Zn_2Cu(AsO_4)_2$. Analysis not given. Cleavage (010) perfect, (100) good, also (001) and $(\bar{1}01)$. Optically biaxial, negative, *ns* α 1.795, β 1.842, γ 1.874, 2V 80°. H. 4, G. 5.23. A blue powder, obtained by heating a mixture of $Zn_2As_2O_7+CuO$ for 14 hours at 850°, gave an *x*-ray powder pattern identical to that of the mineral. The *x*-ray powder data are not given.

The name is for Professor I. N. Stranski of Berlin.

M. F.

Talmessite

P. Bariand and P. Herpin. Un arséniate de calcium et de magnesium, isomorphe de la β-roselite. *Bull. soc. franc. mineral. et crist.*, **83,** 118–121 (1960).

The mineral occurs in pale green crystals, less than 0.1 mm., in the zone of oxidation of the Talmessi Mine, 35 km. west of Anarak, central Iran, associated with aragonite and dolomite. The ore contains abundant niccolite, algodonite, and domeykite. Analysis on 300 mg. gave As_2O_5 47.7, CaO 29.5, BaO 3.2, MgO 7.5, NiO 0.8, H_2O 6.7, sum 95.4%, corresponding to $(Ca_{2.29}Ba_{0.09})(Mg_{0.85}Ni_{0.05})H_{1.61}(AsO_4)_{1.80}$. The deviations from the formula $Ca_2Mg(AsO_4)_2 \cdot 2H_2O$ may have been due to the presence of aragonite; CO_2 was not determined.

The indexed *x*-ray powder pattern is nearly identical with that of beta-roselite (Frondel, *Am. Mineral.* **40,** 828–833 (1955)). The strongest lines are 3.10 (10), 3.07 (10), 2.77 (9), 5.06 and 5.03 (8), 3.57 (8), 3.44 (7), 3.19 (7), 2.82 (7), 1.71 (7). By comparison with beta-roselite, this gives a triclinic unit cell with *a* 5.89, *b* 7.69, *c* 5.56 Å, α 112°38′, β 70°49′, γ 119°25′.

G. 3.421 (measured), 3.491 (calcd.). Biaxial negative, colorless in section, *ns* α 1.680, γ 1.69. A thermogravimetric curve shows loss of H_2O at 450°.

An analysis is also given of material called beta-roselite from Bou Azzer, Morocco, which contained As_2O_5 55.9, CaO 27.3, CoO 8.6, MgO 8.6, sum 100.4, corresponding to $Mg_{0.84}Co_{0.45}$, therefore actually a cobaltoan talmessite. It had G. 3.574 (measured), 3.597 (calcd.) optically biaxial negative, *ns* α 1.695, γ 1.73, pleochroic colorless to pale rose.

The name is for the mine.

Discussion.—The name was accepted by the Committee on Nomenclature of the French Society, which recommended that a new analysis be made. Evidently there is a triclinic series from beta-roselite (Co) to talmessite (Mg).

M. F.

Rusakovite

E. A. Ankinovich. A new vanadium mineral, rusakovite. *Zapiski Vses. Mineralog. Obshch.*, **89,** 440–447 (1960) (in Russian).

The mineral occurs in a surface, partially oxidized layer of carbonaceous shale, which contains apatite, collophane, vanadium-bearing mica, and sulfides of Cu, Zn, Pb, and V, in northwestern Kara-Tau. Steigerite, fervanite, satpaevite, and al'vanite have previously been described from these shales (*Am. Mineral.*, **44,** 1325–1326 (1959)).

Analyses of the mineral from Balasauskandyk by S. I. Potok and T. L. Vileshina gave MgO 1.40, 1.30, tr.; CaO 0.30, 0.20, 0.40; Al_2O_3 5.00, 4.80, 5.50; Fe_2O_3 45.00, 45.30, 43.70; SiO_2 1.80, 1.60, 2.50; V_2O_4 5.00, 4.80, 5.10; V_2O_5 16.60, 16.40, 16.13; P_2O_5 6.50, 6.40, 5.80; SO_2 (should be SO_3 ? M.F.) 1.00, not detd., 1.70; H_2O^+ 13.30, 14.50, 14.60; H_2O^- 5.00, 4.30, 4.80, total 100.90, 99.60, 100.23%. Neglecting MgO, CaO, SiO_2, SO_2, and V_2O_4, these give $(Fe,Al)_5\,[(V,P)O_4]_2(OH)_9 \cdot 3H_2O$, with Fe:Al=4:1 and V:P=2:1. A D.T.A. curve by K. A. Sosenko showed a very strong endothermal effect at 50–190° and a weak one at 280–366° and exothermal effects at 450–535° and 575–610°. The mineral is easily soluble in cold dilute acids. When treated in the closed tube it gives off acid water and turns brick-red.

The mineral occurs as crusts, veinlets, and reniform concretions on a colloidal hydrated Fe-Al phosphate of composition $6(Fe,Al)_2O_3 \cdot P_2O_5 \cdot aq.$, and is replaced by ferri-allophane and iron hydroxides. Electron microscope photographs by E. I. Soboleva show the mineral to be in a form resembling rough splinter-like lamellae. Color yellow-orange to reddish-yellow, streak ocher-yellow, luster dull. Hardness 1.5–2, G. (by suspension) 2.73–2.80. Under the microscope gold-yellow grains up to a few microns in size, weakly polarizing, n 1.833±0.004 (by G. A. Pashkova).

X-ray powder data by G. I. Luk'yantsev and E. M. Baigulov are given. The strongest lines are 3.21 (10), 2.945 (9), 2.441 (8), 2.140 (7), 1.569 (6), 4.20 (5). Heating at 600° gave a different phase; strongest lines 1.691 (10), 1.450 (9), 1.482 (8), 2.689 (7). The pattern is distinctly different from those of the Fe-V minerals fervanite and nolanite.

The name is for Mikhail Petrovich Rusakov, geologist of Kazakhstan.

Discussion.—If the V_2O_4 is considered part of the mineral, the formula obtained is somewhat different.

M. F.

Vaterite

J. D. C. McConnell. Vaterite from Ballycraigy, Larne, Northern Ireland. *Mineralog. Mag.*, **32,** 535–544 (1960).

Vaterite was identified by x-ray study of a very finely fibrous or platy mineral with high birefringence in hydrogel pseudomorphs after larnite. This is the first reported natural occurrence, although paramorphs of calcite after vaterite were recently described by Ilyinskii, *Doklady Akad. Nauk SSSR*, v. **121,** p. 541 (1958). The artificial compound has long been known, see *Dana's System, 7th Ed.*, **2,** 181–182 (1951).

M. F.

Mozambikite

J. M. Cotelo Neiva and J. M. Correia Neves. Pegmatites of Alto-Ligonha, Mozambique, Poruguese East Africa. *Internatl. Geol. Congress, Rept. 21st Session, Copenhagen,* **1960,** Pt. 17, p. 53–62 (in English).

A preliminary report. The mineral occurs in the granite pegmatite at Muiane. The analysis "under reservations" gave SiO_2 11.00, ThO_2 58.80, U_3O_8 6.04, CaO 0.59,

$(R.E.)_2O_3$ 8.60, Fe_2O_3 0.22, Al_2O_3 4.40, H_2O 5.33%. *X*-ray spectrographic analysis also showed Zr, Y important; Pb, Er, Gd, "Sa" (Sm?) and Mn traces. The mineral loses H_2O at 115°. Its structure is the same before and after heating at 1000°; $a_0=5.704$ Å.

The mineral occurs in yellow-brown octahedra. G. 5.24. Index of refraction before heating variable, always below 1.735 and frequently 1.690–1.703; after heating at 1000°, isotropic with *n* (Na) 1.811.

"Mozambikite contains lamellar inclusions of lepidolite. Its faces are somewhat corroded by albite."

The name is presumably for Mozambique. The variant in spelling is not explained.

DISCUSSION.—Insufficient data. The mineral agrees with thorite or thorogummite in all respects except (1) in being cubic before being heated; (2) a_0 is larger than that of pure thorianite (5.596 A).

M. F.

Unnamed

HORST SAALFELD. Strukturen des Hydrargillits und der Zwischenstufen beim Entwässern. *Neues Jahrb. Mineral., Abhandl.*, **95,** 1–87 (1960).

Single crystals of gibbsite from Arö, Norway, were monoclinic, *a* 8.676 ± 0.002, *b* 5.070 ±0.002, *c* 9.721 ± 0.003 Å, β 94°34′±5′, in agreement with Megaw, *Zeitschr. Krist.* **87,** 185 (1934). Crystals from Schischimsk, Urals, were in part monoclinic, in part triclinic, in part intergrowths of the two forms. The triclinic polymorph has *a* 17.33_8, *b* 10.08_6, *c* 7.73_0 Å, α 94°10′, β 92°08′, γ 90°00′. The monoclinic dimorph has 2V 0–5°, the triclinic dimorph has 2V 25–40°.

M. F.

NEW DATA

Bafertisite

E. I. SEMENOV AND P'EI-SHAN CHANG. New mineral bafertisite. *Sci. Record (Peking)*, **3,** 652–655 (1959) (in Russian), through *Chem. Abs.*, **54,** 13996 (1960).

Data given are as in the abstract in *Am. Mineral.* **45,** 754 (1960) with the following additions: Analysis SiO_2 23.68, TiO_2 15.39, Nb_2O_5 0.84, Al_2O_3 0.29, Fe_2O_3 1.08, FeO 22.56, MgO 0.50, MnO 1.62, CaO 0.37, BaO 29.98, K_2O 0.12, Na_2O 0.49, H_2O^+ 1.65, H_2O^- 1.14, Cl 0.63, sum 100.34 $(0=Cl_2)$ 0.14=100.20%. The mineral occurs in the Baiyun-Obo deposit, Inner Mongolia.

M. F.

Batisite

S. M. KRAVCHENKO, E. V. VLASOVA, AND N. G. PINEVICH. Batisite, a new mineral. *Doklady Akad. Nauk SSSR*, **133,** 657–660 (1960) (in Russian).

New data added to that given in *Am. Mineral.* **45,** 908–909 (1960) are: Orthorhombic, *a* 10.41 ± 0.05, *b* 13.85 ± 0.05, *c* 8.06 ± 0.02 kX. Optically biaxial, pos., *ns* α 1.730, β 1.735, γ 1.791, all ±0.001, 2V 7°, $r<v$, strong. Insol. in HCl, HNO_3, H_2SO_4. Easily melts B.B. to a brown transparent bead. Spectrographic analysis shows 0.0*n*% V, 0.00*n*% Pb, Cu; 0.000*n*% Be. The formula is $Na_2BaTi_2(Si_2O_7)_2$. *X*-ray study shows it to be isostructural with shcherbakovite, $(K, Na, Ba)_3(Ti, Nb)_2(Si_2O_7)_2$, which is orthorhombic, not monoclinic as originally reported (*Am. Mineral.* **40,** 788 (1955)), and which differs in having $K>Na$ and in containing appreciable Nb_2O_5. Indexed *x*-ray powder data are given for batisite; the strongest lines (appreciably different from the previous report) are 2.91 (10), 3.39 (5), 2.16 (5), 1.68 (5), and 2.09 (4).

M. F.