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NEW MINERAL NAMES

MICHAEL FLEISCHER

Tosudite

V. A. FRANK-KAMENETSKII, N. V. LOGVINENKO AND V. A. DRITS, A dioctahedral mixed-layer clay mineral, tosudite. *Zapiski Vses. Mineralog. Obshch.*, **92,** 560–565 (1963) (in Russian).

Alushtite was previously described (*Mineral. Abs.* **16,** 279) as containing a mixed-layer phase that consisted of dickite and montmorillonite. Extended study shows that this phase is in fact a regularly alternating structure describable in loose usage as alternation of a dioctahedral chlorite with montmorillonite. Observed 001 diffraction sequences of natural and of glycerated specimens up to 14 order permit one-dimensional Fourier syntheses indicating both pyrophyllite—and gibbsite-like levels. The mineral is dark blue to azure-blue. The analysis, after deducting dickite, quartz and hematite, is given as $K_{0.07}Ca_{0.23}Na_{0.25}(Al_5Mg_1)(Si_7Al_1)O_{18.2}(OH)_{11.8}\cdot 5H_2O$. The mineral has positive elongation, α 1.542–1.547, γ1.554–1.562, $c\wedge Z=3-5°$, X perpendicular to (001).

The name is for Toshio Sudo of the University of Tokyo, who described a similar assemblage (*Mineral. Abs.* **14,** p. 96).

W. F. BRADLEY

Weilite

P. HERPIN AND R. PIERROT, La weilite, un nouvel arséniate de calcium isomorphe de la monétite. *Bull. Soc. franç. Mineral.* **86,** 368–372 (1963).

Weilite occurs as a secondary mineral in the oxidized zone of As-rich veins; the specimens studied are from various museums and were collected in France and Germany. It is often an alteration product of pharmacolite and haidingerite, which are identical in composition with it except for 2 and 1 H_2O respectively. The implied dehydration takes place in 3 months at 120° C. but does not proceed in the same time at ordinary temperatures even in the presence of P_2O_5 or H_2SO_4.

Weilite is white, procellainous in appearance, of greasy, slightly pearly luster, and occurs as powdery incrustations or pseudomorphs after pharmacolite or haidingerite. It is triclinic, $P\bar{1}$, with $a=7.11\pm0.05$ Å, $b=6.94\pm0.03$ Å, $c=7.15\pm0.05$ Å, $\alpha=94°(19')\pm1°$, $\beta=101°(35')\pm1°$, $\gamma=87°(22')\pm1°$. The calculated density, for cell contents $4CaH(AsO_4)$, is 3.45 ± 0.05 gm/cm^3; the measured density is 3.48 ± 0.01 gm/cm^3. The mineral is biaxial negative with $2V_X=82°\pm1°$:$X\wedge$plane $(001)=20°\pm2°$; $Y\wedge$plane $(001)=27°\pm2°$; $Z\wedge$normal to plane $(001)=34°\pm2°$. Apparent indices of refraction measured in the plane (001) are $\gamma'=1.688\pm0.002$; $\alpha'=1.664\pm0.002$.

The x-ray-diffraction powder pattern of weilite agrees satisfactorily with that of the artificial compound; the conspicuous lines are (d in Å): 3.43, 3.07, very very strong; 3.42, 2.80, strong; 2.58, moderately strong.

Pure weilite could not be separated completely from associated pharmacolite; the excess H_2O in the original analyses corresponds to approximately 10% pharmacolite ($CaHAsO_4\cdot 2H_2O$), which was subtracted from the following recalculated analyses of material from Sainte-Marie-aux-Mines and Schneeberg, respectively: As_2O_5 64.1, 61.7; CaO 30.7, 33.1; H_2O 5.2, 5.2.

The specimens studied are in the collections of l'École Nationale Supérieure des Mines de Paris. The mineral is named for R. Weil, French mineralogist known for his studies of Alsatian minerals. Weilite was discovered and identified in 1959 by F. Permingeat, who entrusted the detailed study to the authors. The name was approved by the Commission on New Names and Mineral Names, IMA.

PRIESTLY TOULMIN, 3RD

Marokite

C. Gaudefroy, C. Jouravsky and F. Permingeat. La marokite, $CaMn_2O_4$, une nouvelle espèce minérale. *Bull. Soc. franc. Mineral.* **86,** 359–367 (1963).

Marokite occurs in a gangue of Mn-free calcite and barite, associated with hausmannite, braunite, rare crednerite and polianite and as yet unidentified minerals. The type specimen is from the dump of no. 2 vein at Tachgagalt, 17 km SSE of Ouarzazate, Morocco.

Marokite occurs in large ($5 \times 1.5 \times 0.5$ cm max.) untwinned orthorhombic crystals flattened on (010) with perfect cleavage on (100) and good cleavage on (001). The space group is *Pmab* or $P2_1ab$, with $a = 9.71 \pm 0.02$ Å, $b = 10.03 \pm 0.02$ Å, $c = 3.16_2 \pm 0.005$ Å according to Weissenberg measurements; an indexed powder pattern (55 lines, of which the 38 largest d-spacings are indexed) gave $a = 9.66$, $b = 10.00$, $c = 3.16$ Å. The calculated density for cell contents $4CaMn_2O_4$ is 4.63 ± 0.04 gm/cm^3; specific gravity at 20° C. is 4.64 ± 0.02. Macroscopically, marokite is black, opaque with dark red internal reflection, bright luster, reddish-brown streak.

Marokite is biaxial negative, $2V_X = 20° - 25°$; $X = c$, and the plane of the optic axes is (100). It is very strongly pleochroic, with X safflower red and $Y \approx Z$ opaque (very dark red in very thin sections). Indices of refraction, calculated from reflectivity measurements, are: $\gamma \approx \beta \approx 2.42$; $\alpha \lesssim 2.10$. Direct measurement gave α approximately 2.07 ± 0.02. In polished section, marokite is gray with a distinct brown tinge, slightly darker than hausmannite and darker and browner than braunite. Parallel to (100) and (010), reflection pleochroism is yellowish gray to gray-brown; anisotropism is distinct and strong, with intense and characteristic polarization colors (yellowish-green to greenish-yellow). Parallel to (001), no pleochroism is apparent, and the polarization colors (violet to the color of wine dregs) remain intense on rotation of the stage. Quantitative reflectivity measurements show very little dispersion, the reflectivity varying with crystallographic orientation from 16.2% to 19.4%.

Analysis gives MnO_2 38.94, MnO 31.38, CaO 25.60 (of which 0.67 is regarded as calcite), in good agreement with the proposed formula $CaMn_2O_4$; major impurities are Fe_2O_3 1.60, SiO_2 0.62, and CO_2 0.52. Sum of whole analysis is 99.76. DTA showed no transformation up to 1180° C; marokite quenched after having been heated 1 hr at 1400° C was unaffected.

The powder pattern, which is the same as that for the synthetic product, has the following conspicuous lines (d in Å): 2.87, 2.22, very strong; 2.29, 2.07, strong; 2.87, 2.56, 1.63, 1.58, 1.49, 1.48, 1.080, medium.

The type material has been divided between the mineralogy collection of the Division de la Géologie du Maroc at Rabat and that of l'École Nationale Supérieure des Mines de Paris. The name has been approved by the Commission on New Minerals and Mineral Names, IMA. The name is for the country of the discovery.

Priestly Toulmin, 3rd

Femaghastingsite

G. Borley and M. T. Frost, Some observations on igneous ferrohastingsites. *Mineral· Mag.* **33,** 646–662 (1963).

The authors have subdivided the hastingsite "group" as follows: hastingsite, from 100 to 65 mol % of the Mg end-member; femaghastingsite, from 65 to 35 mol % of the Mg end-member; and ferrohastingsite, from 35 to 0 mol % of the Mg end-member (65 to 100 mol % of the Fe^{2+} end-member).

Discussion:—An unnecessary name for ferroan hastingsite and magnesian ferrohastingsite.

J. A. Mandarino

Unnamed dimorph of cobaltite

A. P. Polushkina and G. A. Sidorenko, A structural variety of cobaltite. *Doklady Akad Nauk SSSR* **153** (6), 1420–1423 (1963) (in Russian).

The mineral occurs in a copper-cobalt ore of the Tuva Autonomous Region, in quartz veinlets with subordinate calcite and dolomite. It cuts pyrite and forms rims around arsenopyrite, and forms crystals up to 0.06 mm. Some of these show zoning when etched with 1:1 HNO_3. The mineral is dark steel-gray with dull luster. Optically resembles arsenopyrite except for being weakly anisotropic. Reflecting power high, about 50. Shows a slight creamy tint in immersion. H 5.5.

Analysis of material picked under the binoculars and purified by heavy liquids gave Co 16.00, Ni 5.30, Fe 2.13, As 28.59, S 13.63, Cu 0.22, Bi 0.055, insol. in HNO_3 28.30, sum 94.23%. The missing remainder is presumed to be silicates and carbonates dissolved by HNO_3. After deducting 3.0% arsenopyrite, 2.1% pyrite, and 0.5% chalcopyrite, recalculation gives Co. 26.5, Ni 8.8, As 45.1, S 19.6%, corresponding to (Co, Ni)AsS with Co/Ni=3.

The *x*-ray powder pattern (39 lines) resembles that of marcasite and was indexed accordingly. The strongest lines are 2.72 (10)(020), 1.800 (10)(211), 2.465 (9)(111), 1.120 (9)(410,312), 2. 382 (8)(120), 1.063 (8)(411, 322), 1.017 (8)(213?), 1.629 (7)(031, 102), 1.036 (7)(203), 0.987 (7)(242), 0.983 (7)(033), 1.537 (6)(131), 1.392 (6)(040, 301, 220), 1.195 (6)(240?). From the powder data, the space group is *Pnnm*, *a* 4.56, *b* 5.55, *c* 3.53 (all ±0.03) Å.

Unnamed silver bismuth telluride

M. S. Bezsmertnaya and L. N. Soboleva, A new telluride of bismuth and silver, established by the newest micromethods. *Trudy Inst. Mineralog., Geokhim., Kristallokhim Redkikh. Elementov,* **18,** 70–84 (1963) (in Russian).

The mineral was found in gold ores of Armenia, always as complex intergrowths in tellurobismuthite in areas of inclusions of hessite and altaite, which replace tellurobismuthite. Microspectrographic analyses show major Bi, Ag, Te; minor Sb, Pb; S was not found. The formula $AgBiTe_2$ (?) is given (basis? MF).

Optical study showed the mineral to be very weakly anisotropic without color effects. Birefringence very slight, noted only in immersion (distinction from tellurobismuthite). Polishes better than other tellurides, has somewhat more relief. Cleavages one perfect, two imperfect. Reflecting power 40.7–45.4 in oil, 71% in air.

X-ray powder data are given for 7 samples. The strongest lines are 3.14–3.17 (10), 2.23–2.25 (1.5–4), 2.13–2.17 (1.5–3), 2.29–2.37 (1–4).

NEW DATA

Osmium-iridium alloys

M. H. Hey, the nomenclature of the natural alloys of osmium and iridium. *Mineral. Mag.* **33,** 712–717 (1963).

After reviewing the history of the nomenclature of the natural Os-Ir Alloys, Hey suggests that the following names are most suitable:

Cubic series	Hexagonal series
Platiniridium	Iridosmine (Os>32%)
Iridium (not known in nature)	Osmium (Os>~80%)
Osmiridium (Os<32%)	

In addition, iridosmine may be divided into two varieties: nevyanskite (Os-poor) and sysertskite (Os-rich).

DISCUSSION.—Dr. Hey has suggested a good system of nomenclature which should serve well for these particular minerals. The scarcity of good analyses of natural Os-Ir alloys still leaves much to be desired. I would prefer to see the varietal names nevyanskite and systerskite dropped.

J. A. MANDARINO

Bayerite

S. GROSS AND L. HELLER, A natural occurrence of bayerite. *Mineral. Mag.* **33,** 723–724 (1963).

Bayerite, $Al(OH)_3$, previously unreported in nature, has been identified in two samples of sedimentary rocks in Harturim, Israel. The rocks contain portlandite and ettringite. The bayerite is associated with calcite in one specimen and with calcite and gypsum in the other. It occurs as very fine white fibers showing parallel extinction. The *x*-ray powder data agree with those of synthetic bayerite.

J. A. MANDARINO

Perovskite group

E. H. NICKEL AND R. C. MCADAM, Niobian perovskite from Oka, Quebec; a new classification for minerals of the perovskite group. *Canad. Mineral.* **7** (5) 683–697 (1963).

Chemical analysis (R. C. M.) of a perovskite from Oka gave: CaO 25.95, Na_2O 4.03, rare earth oxides 2.03, K_2O 0.03, Nb_2O_5 43.90, TiO_2 10.05, Fe_2O_3 (total iron) 8.74, MgO 2.20, MnO 0.77, SiO_2 0.45, S 0.90, loss on ignition (less S) 0.65, total 99.70. It was assumed that all the SiO_2 and S were due to diopside and pyrite contamination. Recalculation of the analysis after deduction of SiO_2, S, and corresponding amounts of CaO, MgO, and Fe_2O_3 gave the following formula:

$$(Ca_{0.75}Na_{0.21}RE._{0.02})(Nb_{0.54}Ti_{0.21}Fe_{0.16}Mg_{0.08}Mn_{0.02})O_{3.00}$$

This corresponds to the general formula, $A_{0.98}B_{1.01}O_{3.00}$, which is very close to that of perovskite.

No material suitable for single-crystal *x*-ray study was available, but the *x*-ray powder pattern can be indexed on an orthorhombic cell with *a* 5.448, *b* 7.777, *c* 5.553 Å, and a space group *Pcmn*. Strongest lines in the powder pattern (CuKα radiation) are (in Å): 2.744 (100), 3.887 (79), 1.942 (57) 2.773 (30), 1.579 (25), and 1.595 (14). Thirty additional indexed lines are listed.

The mineral occurs as small (~0.2 mm) black cubic crystals. In transmitted light the mineral is dark grayish-brown and exhibits moderate anisotropism. Complex twinning is present in practically all of the crystals. The specific gravity is: 4.40 (pycnometer), 4.457 (calc.)

Seven other perovskites from the area were analyzed for Nb_2O_5, with the following results: 14.5, 25.3, 32.0, 32.8, 36.8, 43.0, and 44.9 wt. %.

DISCUSSION:—Nickel proposes a classification of the perovskite group (ABO_3) based on the net valency of the cations in the A position. Consequently, he recognizes the following species: perovskite, lueshite and loparite. According to his classification, the mineral described from Oka is a niobian perovskite. It seems rather unfortunate to apply the prefix niobian to a mineral whose "A" cations conform reasonably well to those present in the mineral perovskite, but whose dominant "B" cation (niobium) is present in a quantity more than twice that of titanium. I think there is every justification for a new name since it appears that this mineral is essentially the niobium analogue of perovskite.

J. A. MANDARINO

Calciborite

S. V. Malinko, N. N. Kuznetsova, V. M. Pensionerova and L. I. Rybakova, New data on calciborite. *Zapiski Vses. Mineralog. Obshch.*, **92,** 684–690 (1963) (in Russian).

Re-examination of type material, thought to have the formula $Ca_5B_8O_{17}$ (*Am. Mineral.* **41,** 815, 1956) showed the presence of considerable amounts of another borate, found by *x*-ray study to be sibirskite. A new microchemical analysis on 100 mg free from sibirskite gave B_2O_3 47.58, MgO 0.81, CaO 44.08, Al_2O_3 0.18, Fe_2O_3 0.22, SiO_2 0.55, CO_2 6.07, As_2O_5 0.30, H_2O^+ 0.17, H_2O^- 0.50, F none, sum 100.46%. After deducting calcite, dolomite and garnet, this gives the formula CaB_2O_4.

DTA study showed two sharp endothermal effects: 850–860° (calcite?) and 1047–1080° (fusion ?). The strongest *x*-ray lines are 3.445 (10), 1.867 (10), 1.970 (9), 7.036 (8), 1.785 (8), 2.66 (7), 2.39 (6).

Rozenite

J. L. Jambor and R. J. Traill, On rozenite and siderotil. *Canad. Mineral.* **7** (5), 751–763 (1963).

Rozenite was named by Kubisz (*Am. Mineral.* **46,** 242, 1961) who defined it as $FeSO_4 \cdot 4H_2O$ which results from the dehydration to melanterite. Fleischer pointed out that the optical data for rozenite were identical to those of siderotil. Because of this and because the original chemical analysis of siderotil (which yielded a formula of $FeSO_4 \cdot 5H_2O$) was not conclusive, Fleischer suggested that the name rozenite was unnecessary and suggested that siderotil be used for $FeSO_4 \cdot 4H_2O$.

Jambor and Traill point out that the original description of siderotil by Schrauf in 1891 was inadequate and that Larsen and Glenn (*Am. Jour. Sci.* **50,** 225–233, 1920) obtained optical data for a supposedly similar mineral which was not analyzed and not from the type locality. Subsequent compilers of optical data perpetuated the error.

Rozenite has now been found in Manitoba (Tp. 44, R. 28, W. of 1st meridian). Its properties agree with those given for type rozenite by Kubisz. Data for the Manitoba mineral are as follows. Optically biaxial (sign not given, but probably negative), α 1.527, β 1.536, γ' 1.541, 2V (not given, but probably large). The calculated specific gravity is 2.29 as compared to Kubisz's measured value of 2.195. Space group $P2_1/n$, *a* 5.945, *b* 13.59, *c* 7.94 Å, β 90°30′. Strongest lines (in Å) in the indexed powder pattern (FeKα radiation) are: 4.47 (10), 5.46 (9), 3.97 (7), 3.40 (6), 6.85 (5), 3.22 (5), and 2.953 (5). Twenty-nine additional indexed spacings are given.

Chemical analysis of the Manitoba mineral (S. Courville, analyst) gave: FeO 30.65, Fe_2O_3 0.80, SO_3 35.91, H_2O 31.90, total 99.26. Spectrographic analysis showed 0.01–0.1% Mg, Al, Ni and Cu. These data give an oxide formula of $0.98\ FeO \cdot 1.02\ SO_3 \cdot 4.02\ H_2O$, in good agreement with the theoretical 1:1:4 compound.

Discussion:—There seems to be little doubt that rozenite is an acceptable name for a valid mineral species. The authors point out that the "siderotil" described by Midgley (*Am. Mineral.* **47,** 404–409, 1962) from the Thames River is really rozenite.

J. A. Mandarino

Siderotil

J. L. Jambor and R. J. Traill, *op. cit.*

From a study of natural and synthetic iron sulfates, it is concluded that the name siderotil should be applied to $(Fe, X)SO_4 \cdot 5H_2O$, where X is any cation or group of cations individually less abundant than Fe. The pure compound probably does not exist in nature, but several examples of the cuprian variety are known. These varieties form by dehydration from cuprian melanterite. The so-called "iron-copper chalcanthite" of Larsen (*U. S. Geol. Surv. Bull.* **679,** 1921) is cuprian siderotil.

Data for a cuprian siderotil $(Fe_{0.55}Cu_{0.44}Co_{0.01})SO_4\cdot 5H_2O$, from Yeungton, Nevada are as follows. Triclinic, a 6.26, b 10.59, c 6.05 Å, α 92°08′, β 110°10′, γ 77°05′. Optically biaxial (−), α' 1.515, β' 1.525, γ' 1.535, 2V 50°–60°. Specific gravity: 2.1–2.2 (by suspension in heavy liquids), 2.212 (calc.). Strongest lines in the x-ray powder pattern (FeKα radiation) are (in Å): 4.89 (10), 3.73 (8), 5.57 (6), 5.73 (5), 3.21 (4), 2.92 (4), and 2.68 (4). A total of twenty-three indexed spacings is given. The 3.21 Å line cannot be indexed satisfactory with the chosen cell.

Discussion:—This re-definition of siderotil and the preceding data on rozenite should do much to clarify the nomenclature of these lower hydrates of iron sulfate. The nomenclature has been approved by the Commission on New Minerals and Mineral Names, IMA

J. A. Mandarino

DISCREDITED MINERALS

Cossyrite (=Enigmatite)

Cossyrite has long been thought, on the basis of its composition, to be identical with enigmatite. This is now verified by x-ray powder data by A. S. Anisimova on cossyrite from the type localty, Pantelleria.

ERRATA

In the New Mineral Names section (*Am. Mineral.* **43,** 790, 1958) the *a* axis value for kirschsteinite is listed incorrectly. It should read 4.859 instead of 5.859. The original paper in *Mineral Mag.* is correct.

The last sentence in paragraph four on page 298 of the article THE GENESIS OF PLAGIOCLASE TWINNING IN THE NONEWAUG GRANITE published in the March-April, Vol. **49,** 1964, issue of *The American Mineralogist* should read—"In addition Vogel (personal communication) has found that granitic igneous rocks exhibit scatter among crystals which he interprets resulting from differences in ordering among crystals at the time of twinning because they have twinned during the ordering process."