THE AMERICAN MINERALOGIST, VOL. 56, JANUARY-FEBRUARY, 1971

NEW MINERAL NAMES

MICHAEL FLEISCHER

Stistaite, Unnamed Cu(Sn, Sb)

E. P. NIKOLAEVA, V. A. GRIGORENKO, S. D. GATARKINA, AND P. E. TSYPKINA (1970). New natural intermetallic compounds of tin, antimony, and copper. *Zap. Vses. Mineral. Obshch.* **99**, *68–70* (in Russian).

Placer samples collected from a region of Silurian shaly-sandy sediments near the right effluent of the Elkiaidan River, eastern North Nuratin Range, Uzbekistan, contained light-gray irregular nodular and platy aggregates with inclusions of country rocks. These comprised about 5% of the heavy mineral fraction. They consisted mainly of metallic tin, with which is closely associated another mineral in well-formed cubic crystals 0.02–0.15 mm. in size. Color light-gray, luster metallic, malleable. Under the microscope they were found to contain inclusions of a second mineral of elongated platy form.

Microprobe analysis of the cubic crystals by V. P. Bykov and L. S. Dubakina gave Sn 56.9, Sb 43.1, sum 100.0%, giving the ratio Sn:Sb=0.479:354. However, small amounts of metallic tin were present and the composition is considered to be SnSb. The X-ray pattern (13 lines given) corresponds to that of synthetic SnSb with a 4.15±0.1A. The strongest lines are 3.09 (10)(110), 2.19 (10)(200), 1.374 (8)(310), 1.253 (7)(222), 1.022 (6)(400).

The mineral is insoluble in HCl, partly dissolved by dilute HNO_3, dissolved completely with effervescence by concentrated HNO_3. Under the reflecting microscope, creamy-white, isotropic, reflectance (%) 460 nm 78.0, 540nm 81.6, 600 nm 81.5, 660 nm 82.5. Microhardness 103–127, av. 115 kg/sq. mm.

The name stistaite is for the composition. The mineral was approved before publication by the Commission on New Minerals and Mineral Names, IMA.

Microprobe analysis of the platy inclusions gave Sn 56.5, Sb 8.2, Cu 33.4, Fe 0.5, sum 98.6%, or approximately Cu(Sn,Sb). X-ray data and hardness could not be determined because of the small size (hundreths of a mm.); harder than stistaite. Anisotropic and distinctly birefringent with variation of color in lilac-rose tones. Reflectances (Ng' and Np') are given 11 wavelengths (%): 460 nm 68.6, 48.3; 540 nm 65.2, 43.0; 600 nm 67.5, 44.6; 660 nm 68.6, 47.3.

Associated with these minerals in the heavy fractions are present zircon, leucoxene, rutile, apatite, anatase, andalusite, barite, celestite, scheelite, and cinnabar.

DISCUSSION.- One member of the IMA Commission considers it probable that these are not naturally occurring minerals, but artifacts.

Unnamed bismuth-palladium mineral

L. A. CHERNYAEV AND O. E. YUSHKO-ZAKHAROVA (1968) Diagnosis of micro-inclusions of minerals of the platinum group by means of the JXA-3A X-ray spectrographic micro-analyzer. *In Physical Properties of Rare-Metal Minerals and Methods for Their Study.* Izdat. "Nauka", p. 80–101 (in Russian).

Electron probe analyses gave Bi 82–88, av. 86, Pd 13–16, av. 15%, corresponding to $PdBi_3$. White in reflected light, reflectance higher than that of michenerite. Strongly anisotropic. Microhardness 105–125 kg/sq. mm. Occurs in grains, not exceeding 0.1 mm, usually 0.01–0.001 mm., associated with tellurides in the Monchegorsk ores.

Aktashite

V. I. VASIL'EV (1968) New ore minerals of the mercury deposits of Cornyi Altai and their parageneses. *In Problems of the Metallogeny of Mercury* Izdat. "Nauka" Moscow, p. 111–129 (in Russian).

A chemical analysis by L. A. Nepeina and a microprobe analysis (av. of 2) by G. V. Berlichevskii gave, respectively; Hg 33.41, 32.54; Cu 23.98, 23.38; As 17.56, 18.20; Sb 2.50, 2.55; S 23.80; sum 100.65, 100.47%. (These correspond to $Hg_{0.69}Cu_{1.57}(As_{0.97}Sb_{0.08})S_3$ and $Hg_{0.66}Cu_{1.49}(As_{0.98}Sb_{0.08})S_3$, respectively. M.F.) Electron probe data show that these constituents are distributed uniformly within the grains.

X-ray powder data correspond to a cubic mineral with *a* 5.398 Å. (half the unit cell of tetrahedrite-tennantite). The X-ray powder pattern (11 lines given) is very similar to those of sphalerite, tetrahedrite, and tennantite; the strongest lines are 3.12 (100)(111) 2.70 (22)(200), 1.909 (54)(220), 1,627 (40)(311), 1.238 (15)(331), 1.101 (10)(422).

The mineral resembles tennantite and metacinnabar. Occurs mainly as xenomorphic grains, rarely in crystals resembling trigonal pyramids. Brittle, microhardness 300–346, av. 313 kg/sq. mm. (50 g. load, 20 measurements). No cleavage. Good conductor of electricity. In reflected light white, reflectance close to that of cinnabar. Very weakly birefringent, weakly anisotropic in shales of pale blue. No internal reflections. Not attacked by standard etch reagents except HNO_3, with which it turns brown, then gives blue to violet films.

The mineral, provisionally named aktashite, occurs in the Aktash mercury deposit, Gornyi Altai, where it is associated with quartz, pyrite, calcite, sphalerite, stibnite, chalcostibite, mercurian tetrahedrite, tennantite, luzonite, enargite, chalacopyrite, cinnabar, dickite, and orpiment.

The name is for the deposit.

DISCUSSION—Further study is needed. The maximum mercury content reported for tetrahedrite-tennantite is about 17%.

Scheibeite (=Phoenicochroite)

ARNO MÜCKE (1970) Scheibeite, ein neues Chromatmineral. *Neues Jahrb. Mineral., Monatsh. 6*, 276–282.

Deep red transparent crystals from Mina Sta. Ana. Sierra Gorda, Caracoles, Chile, contained Pb and Cr. Analysis could not be made because of insufficient material, but analysis of synthetic material giving the same X-ray pattern as the natural gave PbO 53.31, $PbCrO_4$ 48.86, sum 100.17%, corresponding to $Pb_8(CrO_4)_3O_5$. Weissenberg photographs showed it to be monoclinic, a15.155±0.006, b5.679±0.003, c14.032±0.006A. β121°36′, space group $C2/c$ or Cc, $Z=2$, 6.73 (measured, synthetic), 6.737 (calcd.). The strongest lines are 3.391 (10)($\bar{3}13$), 2.984 (10)(004), 2.839 (8)(020), 2.058 (7)(024), 1.727 (8)($\bar{7}17$). Cleavages {100} very good, {201} good, {010} less good. *H*. 3. Optically biaxial negative, β 2.3, γ 2.66, extinction on (010) 20–25°, high dispersion.

The name is for Robert Scheibe, 1859–1923, formerly Professor of Mineralogy, Tech. Hochschule Berlin.

DISCUSSION.—The mineral is undoubtedly identical with phoenicochroite, $Pb_2(CrO_4)O$, as described by Williams, McLean, and Anthony, *Amer. Mineral.* 55, 784–792 (1970). The probable identity had been pointed out to the author by the Commission on New Minerals and Mineral Names, IMA, but the paper was unfortunately published before the Commission could vote. The name scheibeite (Linstow, 1912) had already been used for a resin (Hey, 33.4.1)

Unnamed lead iodate

A. MÜCKE (1969) Schwartzembergit und ein neues Iodat-Mineral (abstr.) *Fortschr. Mineral.* **47**, 45 (publ. 1970.).

A new mineral occurs intergrown with schwartzembergite at Mina Santa Ana, Caracoles, Sierra Gorda, Chile. Crystals are thin, mica-like. Tetragonal, *a* 5.632±0.002, *c* 27.288±0.007A. No analysis, but material synthesized hydrothermally had the composition $Pb_6Cl_6(IO_3)_2O_2$, G. 6.83, $Z=1.94\sim2$. Schwarzembergite is orthorhombic, *Ccca*, $a=b=5.614$, *c* 12.549, both±0.002A. Formula $Pb_6Cl_4(OI_3)_2(OH)_2O_2$. G. 7.09, $Z=0.94\sim1$.

Azoproite

A. A. Konev, V. S. Lebedeva, A. A. Kashaev, and Z. F. Ushchapovskaya (1970) Azoproite, a new mineral of the ludwigite group. *Zap. Vses. Mineral. Obshch.* **99**, 225–231 (in Russian).

Analysis by V. S. L. of a sample prepared by magnetic separation and centrifuging gave TiO_2 14.78, Al_2O_3 0.38, Fe_2O_3 15.37, FeO 5.04, MgO 45.09, MnO 0.11, CaO 0.35, Na_2O trace, B_2O_3 18.30, SiO_2 1.35, sum 100.77%. Spectrographic analyses showed up to 0.1% Zr, 0.03% Sr. and 0.10% V. After deducting small amounts of forsterite, spinel, and calcite, this gave the formula:

$$(Mg_{7.27}\overset{2+}{Fe}_{0.53}Mn_{0.01})(\overset{3+}{Fe}_{1.49}Ti_{1.43}Mg_{1.00})B_{4.06}O_{20}, \qquad \text{i.e.,}$$

a member of the ludwigite group in which more than half (about 65%) of the Fe^{3+}has been replaced by Ti^{4+} and Mg^{2+}. A partial analysis of another sample gave TiO_2 18.65, MgO 46.16, FeO 7.20%, suggesting about 80% replacement of $2Fe^{3+}$ by $Ti^{4+}Mg^{2+}$; intermediate compositions between ludwigite and azoproite were also found. The mineral is readily dissolved by dilute HCl, not dissolved by 1:3 HNO_3.

Weissenberg photographs showed the mineral to be orthorhombic, space group *Pbam*, *a* 9.26, *b* 12.25, *c* 3.01 (all±0.01) Å. However, a reflection (100) was observed on the zero layer-line, which may indicate a lower symmetry, The strongest lines (20 given) are 5.07(8)(100), 2.57(10, doublet)(240), 201), 2.16(6)(250, 340), 2.11(5)(141), 2.02(6)(321, 060), 1.900(5)(not indexed).

The mineral occurs as prismatic crystals 1 to 20 mm. long and 0.1 to 5 mm. wide. Color black, luster adamantine, fracture conchoidal. A good cleavage (parting ?) is observed on (010), a less good one on (001). Brittle, *H.* about 5.5. Paramagnetic. ρ. 3.63±0.02. In section transparent, α1.799±0.02, β 1.822±0.03, γ 1.855±0.05, biaxial, positive, $2V>70°$ measured (difficult to measure because of intense color), 80° calcd. Strongly pleochroic, *X* pale green with bluish tint, *Y* dark green, nearly opaque, *Z* reddish-brown, absorption $Y>Z>X$.

The mineral occurs in magnesian skarns in the contact aureole of the Tazheran alkalic massif with calcite, ludwigite, clinohumite, baddeleyite, tazheranite (*Amer. Mineral.* **55**, 318), perovskite, and geikielite.

Type material is preserved in the Fersman Mineralogical Museum, Acad. Sci. USSR, Moscow, The name is for the International Geological Association for the Study of Deep Zones of the Earth's Crust (AZOPRO), because it was found during the preparation of a guidebook for the Association's 12th meeting at Baikal in 1969. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA.

Niggliite, stannopalladinite, michenerite

L. A. Chernyaev and O. E. Yushko-Zakharova (1970) Diagnosis of micro-inclusions of minerals of the platinum group by means of the JXA-3A X-ray spectrographic analyzer. *In Physical Properties of Rare-metal Minerals and Methods for their Study.* Izdat. "Nauka", 80–81 (in Russian).

For niggliite electron probe analyses gave Sn 38–42, av. 40; Pt 58–63, av. 60%, corresponding to PtSn. Strongly birefringent, colors from rose to blue with reflectances in yellow light (%); rose, 65 in air, 50 in immersion; blue, 24 in air, 20 in immersion. Under crossed nicols strongly anisotropic with colors from fire-orange to dark gray-blue. Hardness shows strong anisotropy 306–537 kg/sq. mm. Occurs in the Monchegorsk ores in close association with stannopalladinite, hessite, and tellurides of Pt and Pd.

For stannopalladinite electron probe analysis gave Pd 55–60, av. 58; Pt 1.5–2.5, av. 2.0; Sn 35–40, av. 38%; formula Pd_5Sn_3 (previously given as Pd_3Sn_2). Color brown-rose. Reflectance in yellow light 45.0–50.0%, strongly anisotropic, from red to blue colors. Microhardness 387–452 kg/sq.mm. Occurs in grains up to 0.1 mm. intergrown with niggliite.

For michenerite electron probe analysis from Monchegorsk gave Pd 10–13,av. 12; Pt 8–11, av. 10; Bi 46–52, av. 50; Te 28–33, av. 30%, corresponding to $Pd_2Pt(Bi,Te)_4$. [Compare *Amer. Mineral.* **48,** 1184 (1963)]. Isotropic, reflectance 56%. Microhardness 208–239 kg/sq. mm.

Willyamite

L. J. Cabri, D. C. Harris, J. M. Stewart, and J. F. Rowland (1970) Willyamite redefined. *Proc. Australasian Inst. Minning Met.*, **233**, 95-100.

Willymite, (Co,Ni)SbS with Co:Ni=1:1), was described by Pittman (1893; see *Dana's System 7th Ed.*, 1, 301–302); it has generally been considered to be a cobaltian ullmannite. Examination was made of sample USNM R 849 from the Roebling Collection, labeled "Consols lode, Broken Hill, N. S. Wales, from George Smith, chemist at the mine". Since Smith found the mineral described by Pittman, this sample is regarded as type willyamite.

Microprobe analyses showed that the sample consisted of zoned crystals, several mm. to a side. Analyses gave:

Zone	*a*, Å	Co	Ni	Fe	Sb	As	S	Total
I	5.895±0.003	9.9	17.1	0.1	56.6	0.4	14.9	99.0
II	5.884±0.002	14.9	12.6	0.3	55.3	0.7	14.9	98.7
III	5.860±0.001	20.6	6.9	0.2	55.9	0.7	15.1	99.4
IV	5.850±0.002	23.2	3.8	0.4	54.7	1.6	14.6	98.3
Edge	—	25.2	1.4	0.2	55.5	0.7	15.1	98.1

Reflectances of these samples and of ullmannite were essentially identical; the microhardness was slightly higher for the Co-rich samples. The X-ray patterns differed in that ullmannite and zone I showed no (100) reflection (forbidden by the ullmannite space group $P2_13$), whereas zones II, III, and IV showed weak (100) reflections. Weissenberg and precession study showed that the material of zones II, III, and IV is definitely not cubic, but pseudo-cubic with $\alpha=\beta=\gamma=90°$ within the limits of measurement; the symmetry is lower than orthorhombic.

Willyamite is therefore redefined as the pseudo-cubic portion of the series (Co,Ni)SbS in which Co>Ni. This redefinition was approved before publication by the Commission on New Minerals and Mineral Names, IMA.

Hatchite

W. Nowacki, G. Burri, Peter Engel, and F. Marumo (1967) Über einige Mineralstufen aus dem Lengenbach (Binnatal). II. *Neues Jahrb. Mineral., Monatsh.* **1967,** 43–48.

W. Nowacki (1968) Hachit, Lengenbachit, und Vrbait: *Neues Jahrb. Mineral., Monatsh.* **1968,** 69–75.

Four new microprobe analyses gave Pb 25.5, 25.5, 27.1, 25.5; Tl 25.5, 25.5, 26, 26.5; Ag

8.8, 8.8, 10, 10.5; Cu 2.8, 3, 1.9, 0.7; As 18.1, 17.0, 15.9, 18.1; Sb 1.55, 1.5, 1.5,—;, S 18.4, 18.6, 18, 19.1, sum 100.65, 99.9, 100.4, 100.4. This corresponds to $(Pb, Tl)_2Ag\ As_2S_5$.

Mixite group

Kurt Walenta (1970) Mineralien der Chlorotil-Mixit Gruppe mit seltenen Erden von Fundorten im Schwarzwald. *Chem. Erde* **29**, 36–47.

Qualitative electron probe data, unit cell constants, and ω are given for 21 samples of "chlorotile" and mixite from the Black Forest and Erzgebirge. All contained rare earths or Bi or both, some had minor Ca. Since the type chlorotile sample has been destroyed and no sample has been found that does not contain Bi or rare earths, it is recommended that the name chlorotile be transferred to the rare-earth copper bismuth arsenate.

Discussion.—The Commission on New Minerals and Mineral Names, IMA, knowing of Walenta's data, voted approval of the name *agardite* for this mineral (vote 14–0) [see *Amer. Mineral.* **55**, 1447–1448 (1970)] and there seems to be no reason for reopening the question.