

NEW MINERAL NAMES*

MICHAEL FLEISCHER, GEORGE Y. CHAO, AND L. J. CABRI

Bellidoite*

L. A. DE MONTREUIL (1975) Bellidoite: a new copper selenide. *Econ. Geol.* **70**, 384-387

Electron probe analysis, using Cu and Fe Se as standards, gave Cu 61.5 ± 0.5 , Se 38.0 ± 0.8 , sum 99.5 percent, corresponding to $\text{Cu}_{2.01}\text{Se}_{1.00}$.

X-ray powder data are indexed on a tetragonal cell with a 11.52, c 11.74 Å, close to values obtained by Borchert (1945) for synthetic β - $\text{Cu}_{1.96}\text{Se}$. The strongest X-ray lines (21 given) are 6.80 3 111; 3.38 8 222; 2.26 5 431,115; 2.06 10 404; 1.763 7 226,553. The space group may be $P4_2/n$.

Color in air creamy-white with a slight pinkish-yellow tint, in oil creamy white. Reflectance at 589 nm 28.5 percent. Anisotropy weak, very weak reflection pleochroism noted in oil. Hardness (100 g load) = 33 - 41.

The mineral occurs at Habri, western Moravia, Czechoslovakia, as anhedral grains 0.1 - 0.3 mm in diameter in calcite, associated with berzelianite, umangite, eskebornite, an unnamed mineral (Co, Fe) Se_2 , eucairite, klockmannite, and djurleite.

The name is for Eliodoro Bellido Bravo, director of the Servicio de Geología y Minería, Peru. M.F.

Bismuth Sulfosalts

A. A. GODOVIKOV (1972) Bismuth sulfosalts: features of their chemical composition, synthesis, and classification. *Izdat. "Nauka", Moscow, 1972*, p. 1-302; from an abstract by the late E. M. Bonshtedt-Kupletskaya (1974) *Zapiski Vses. Mineral. Obshch.* **103**, 617.

Published analyses of the bismuth sulfosalts are compiled and recalculated and the following new names are used:

Matildogalena—solid solutions of AgBiS_2 (up to 10%) in galena.

Cuprolillianite, $m \text{Cu}_6\text{Bi}_2\text{S}_6 \cdot n\text{Pb}_3\text{Bi}_2\text{S}_6$

Cuprocosalite, $m \text{Cu}_2\text{S} \cdot n\text{Pb}_2\text{Bi}_2\text{S}_6$

Argentolillianite, $\text{Ag}_2\text{S} \cdot 8\text{Pb}_3\text{Bi}_2\text{S}_6$

Argentocosalite, $\text{Ag}_2\text{S} \cdot 6\text{Pb}_2\text{Bi}_2\text{S}_6$

Argentoaikinite, $(\text{Ag}_2\text{Cu})\text{Pb}_2\text{Bi}_2\text{S}_6$

Plumbomatildite, $\text{Ag}_6\text{PbBi}_6\text{S}_6$

Argentogoongarrite, $(\text{Pb}, \text{Ag})_4\text{Bi}_2\text{S}_7$

Argentocuprocosalite, $(\text{Pb}, \text{Ag}_2\text{Cu}_2)_2\text{Bi}_2\text{S}_6$

Cuprocannizzarite, $(\text{Pb}, \text{Cu})_2\text{Bi}_4\text{S}_7$

Cuproselencannizzarite, $(\text{Pb}, \text{Cu}_2)\text{Bi}_4(\text{S}, \text{Se})_7$

Bismutodiaphorite, $(\text{Ag}, \text{Cu})_6\text{Pb}_4\text{Bi}_4\text{S}_{18}$

These names are based solely on compositions calculated from analyses (many made 50 to 100 years ago), with no evidence, either optical or X-ray, as to homogeneity. The names are a disservice to mineralogy and should not be used. M. F.

* Minerals marked with an asterisk after the name were approved before publication by the Commission on New Minerals and Mineral Names of the International Mineralogical Association.

Challantite

CARLO COTTA RAMUSINO AND GIUSEPPE GIUSEPPE (1973) Occurrence of a natural material referable to the synthetic compounds $6\text{Fe}_2(\text{SO}_4)_3 \cdot \text{Fe}_2\text{O}_3 \cdot n\text{H}_2\text{O}$, from the gold mine of Challant-St. Anselme (Valle d'Ayas) (Aosta. Italy). *Soc. Ital. Sci. Nat. Museo Civico Milano*, **64**, 451-460 (in Italian).

The material was found as a yellow powder in samples of quartzite containing pyrite and native gold from an abandoned gold mine. It consists of extremely small prismatic birefringent crystals.

Analyses of material picked under the binoculars and kept about a year in a dry medium gave Fe_2O_3 30.29, SO_3 38.82, H_2O 31.07, sum 100.18, corresponding to $\text{Fe}_2\text{O}_3 : \text{SO}_3 : \text{H}_2\text{O} = 6.95 : 17.8 : 63.2$ or $6\text{Fe}_2(\text{SO}_4)_3 \cdot \text{Fe}_2\text{O}_3 \cdot 63\text{H}_2\text{O}$, corresponding to a compound synthesized by Recoura in 1907.

The mineral dissolves slowly in water, readily in HCl. The DTA curve shows endothermic breaks at 75-85°, and at 150°, and at 760°. A DTG curve and infrared absorption curves are given. Optical properties could not be measured.

X-ray powder data agree closely with data given for the synthetic compound (card no. 16-897). The strongest lines are 18.39 70, 9.06 100, 6.86 36, 6.04 72, 5.58 80, 4.72 36, 4.03 48, 3.58 78, 3.53 67.

The name is for the locality. Type material is at the University of Pavia and the Museum Avico di Storia Nat., Milan.

Discussion

Single crystal study of synthetic material, and determination of optics and G. would be desirable. M. F.

Hydroastrophyllite

X-RAY LABORATORY, HUBEI (HUPEI) GEOLOGIC COLLEGE (1974) The crystal chemistry of astrophyllite group minerals. *Sci. Geol. Sin.* **1**, 18-33 (in Chinese).

Chemical analysis gave: SiO_2 25.72, TiO_2 9.63, Nb_2O_5 5.01, Ta_2O_5 0.82, Al_2O_3 3.92, Fe_2O_3 24.24, FeO 0.05, MnO 3.37, MnO 8.05, MgO 0.51, CaO 2.40, BaO 0.32, K_2O 1.28, Na_2O 0.53, H_2O^+ 6.65, H_2O^- 5.74, F 1.83, $-\text{O} = \text{F}_2$ 0.77, sum 99.30. The analysis was fitted into the astrophyllite formula using observed cell volume and density as $(\text{K}_{0.91}\text{Ba}_{0.02}(\text{H}_2\text{O})^{+1.87})(\text{Na}_{0.20}\text{Ca}_{0.61}(\text{H}_2\text{O})^+_{0.28})(\text{Fe}^{3+}_{3.48}\text{Mn}^{4+}_{0.44}\text{Mn}^{2+}_{1.30}\text{Mg}_{0.14})(\text{Ti}_{1.38}\text{Nb}_{0.43}\text{Ta}_{0.04})(\text{Si}_{4.92}\text{Al}_{0.88}\text{O}_{17.40}(\text{OH})_{6.60})(\text{O}_{2.61}(\text{OH})_{3.29}\text{F}_{1.10})$. The excess water was thought to be in substitution for K and Na in the form of H_3O^+ and for SiO_2 in the form of $3(\text{OH})$.

X-ray studies showed the mineral to be triclinic with $a = 11.86$, $b = 11.98$, $c = 5.42$ Å, $\alpha = 103^\circ 25'$, $\beta = 95^\circ 09'$, and $\gamma = 112^\circ 12'$. The strongest powder lines (22 given, without indices) are: 10.55 9, 3.51 10, 2.643 8, 2.584 5, 2.118 6, 1.768 6. The strong lines are closer in value to those for niobophyllite than those for astrophyllite.

The mineral is dark brown with two sets of cleavage. Sp. gr. = 3.151. Optically negative with $2V = 40^\circ$, $\alpha = 1.660$, $\beta = 1.720$,

$\gamma = 1.728$. Pleochroism: $X =$ bright yellow, $Y =$ orange yellow, $Z =$ dull yellow. Absorption formula: $Z > Y > X$.

DTA curve showed a major endothermic peak at 155°C (release of H_2O^+ and OH in substitution for SiO_2) and a very broad and weak endothermic peak at (800–1100°C) (release of structural OH). TGA curve showed a major weight loss of (~13.5 percent) at (50–400°C) with two minor breaks at (250° and 280°C) and a second stage weight loss of (~1.5 percent) at (750–800°C). (All numbers in parentheses were interpolated by GYC from graphs).

The mineral occurs as a weathering product, in aggregates of blocky crystals, in an alkalic pegmatite in Szechuan Province, China. **G. Y. C.**

Junoite*

R. R. LARGE AND W. G. MUMME (1975) Junoite, "wittite", and related seleniferous bismuth sulfosalts from Juno Mine, Northern Territory, Australia. *Econ. Geol.* **70**, 369–383.

Electron probe analyses of 11 grains in 6 samples gave Bi 54.7 – 59.0, Pb 19.4 – 21.0, Cu 3.9 – 4.4, Ag 0.4 in 1 sample, Fe 0.1 in 3 samples, S 12.3 – 15.1, Se 3.8 – 11.6, corresponding to the formula $Pb_2Cu_2Bi_2(S,Se)_{16}$ with S, Se ranging from 10.4 to 2.6. (analysts R. R. L., L. F. Brunckhorst, D. Wark).

X-ray powder data are indexed on a monoclinic cell with a 26.66, b 4.06, c 17.03 Å (all ± 0.01 Å), β 127.20° \pm 0.02, space group $C2/m$, $Z = 2$, G calc 6.77. The strongest lines (34 given) are 3.904 **8** 117, 3.545 **10** 600, 3.229 **5** 807, 802, 2.970 **5** 801, 2.919 **7** 317.

In reflected light white with a creamy tint, strongly birefringent and anisotropic. Reflectances at 546 nm, 49 \pm 1% max., 41 \pm 1% min. Polarizing colors range from cream to gray, with green and mauve tints. Hardness (100 g load) 114–213. One good cleavage.

The mineral occurs in irregular grains and tabular crystals at the Juno Mine, Tennant Creek goldfield, where native gold, chalcopyrite, and Bi-sulfosalts occur in magnetite. Junoite is the most abundant Bi mineral; others present are "wittite", selenian heyrovskiyite, and krupkaite.

The name is for the locality. **M. F.**

Krupkaite*

L. ZAK, V. SYNECEK, AND J. HYBLER (1974) Krupkaite, $CuPbBi_2S_8$, a new mineral of the bismuthinite–aikinite group. *Neues Jahrb. Mineral. Monatsh.* **1974**, 533–541.

V. SYNECEK AND J. HYBLER (1974) The crystal structures of krupkaite, $CuPbBi_2S_8$, and of gladite, $CuPbBi_2S_9$, and the classification of superstructures in the bismuthinite–aikinite group. *Neues Jahrb. Mineral. Monatsh.* **1974**, 541–560.

Probe analyses of 3 samples (each av. of 5), with Bi, Pb, Cu, and pyrite standards, gave Bi 58.8, 59.1, 54.4; Pb 21.3, 17.7, 20.7; Cu 4.5, 4.4, 4.9; S 18.3, 17.5, 18.2; sum 102.9, 98.7, 98.2 percent, yielding for S = 6.00, Bi 2.96, 3.12, 2.76; Pb 1.08, 0.94, 1.06; Cu 0.74, 0.77, 0.82.

X-ray study showed the mineral to be orthorhombic, space group $Pb2_1m$, a 11.15, b 11.51, c 4.01 Å, $Z = 2$. The strongest lines (9 given) are 4.05 **4** 220, 3.64 **4** 130, 3.56 **10** 310, 3.13 **9** 211, 2.85 **4** 040, 2.26 **5** 340.

The mineral occurs as fibrous dark steel-gray aggregates in parallel intergrowth with bismuthinite at the molybdenite-feldspar deposit at Krupka, 5 km NNE of Teplica, N. W. Bohemia. In reflected light grayish-white with slight yellowish tint. Reflectances (R'_λ and R'_β , %): 480 nm, 48, 45; 546 nm, 49, 46; 589 nm, 48, 45; 644

nm, 47, 44. Reflection pleochroism not noted. Microhardness (each av. of 6), 192 (125 g load), 180 (50 g load), 187 kg/sq mm (100 g load).

The name is for the locality.

Discussion

This composition has previously been assigned to the mineral lindstromite (*Dana's System*, 7th ed, p. 459). Later work indicates that the type lindstromite had the composition $Pb_3Cu_3Bi_7S_{15}$ and the name lindstromite has been transferred to that compound.

M.F.

Monoclinic Magnesium Astrophyllite

PENG CHI-CHUNG AND MA CHER-SHENG (1963) The discovery of a new type of Si–O chain radical-X-ray analysis of astrophyllite. *Sci. Sin.* **12**, 272–276 (in Russian).

X-RAY LABORATORY, HUBEI (HUPEI) GEOLOGIC COLLEGE (1974) The crystal chemistry of astrophyllite group minerals. *Sci. Geol. Sin.* **1**, 18–33 (in Chinese).

Chemical analysis of the mineral gave: SiO_2 37.98, TiO_2 12.18, Al_2O_3 1.11, Fe_2O_3 2.95, FeO 17.91, MnO 4.00, MgO 6.39, CaO 1.15, K_2O 7.28, Na_2O 5.38, H_2O^+ 3.44, F 0.45, P_2O_5 0.06, $-O = F_2$ 0.19, sum 100.10 percent, corresponding to $Na_{2.16}K_{1.98}(Fe^{3+}_{0.48}Fe^{2+}_{3.05}Mn_{0.70}Ca_{0.25})Mg_{1.98}Ti_{1.88}(Al_{0.27}Si_{7.81}O_{24})[O_{1.98}(OH)_{1.02}][(OH)_{3.70}F_{0.30}]$. Ideal formula derived from structure analysis is $K_2Na_2(Fe^{3+}, Fe^{2+}, Mn)_6Mg_2Ti_2(Si_4O_{12})_2(O, OH)_8(OH, F)_4$. K, Na, Ti, and Mg are ordered in their specific sites.

The mineral is monoclinic, $A2/m$ with $a = 10.56$, $b = 23.00$, $c = 5.35$ Å and $\beta = 102^\circ$ (Peng and Ma gave $a = 10.43$, $b = 23.00$, $c = 5.35$ Å and $\beta = 102^\circ$). There are differences in X-ray powder data of the monoclinic astrophyllite and the Mn-rich triclinic modification. The strongest of the 18 lines (without indices) are: 10.1 **8**, 3.80 **6**, 3.38 **10**, 3.079 **5**, 2.763 **5**, 2.548 **9**, 1.818 **5**, 1.727 **5**, 1.463 **7**.

The mineral is straw yellow with vitreous luster. Cleavage {100} very perfect, {010} perfect. Optically biaxial (–), $2V = 81.5$ – 83° , $\alpha = 1.658$, $\beta = 1.687$ (calc), $\gamma = 1.710$. The mineral is pleochroic with $Z =$ gray, $Y =$ pale yellowish gray, and $X =$ bright yellow. Absorption $Z > Y > X$. $Y = b$, $Z \wedge c = (-)5$ – 6° .

DTA curve showed endothermic peaks at 835°C (strong, escape of OH) and 900°C (weak). TGA (to 950°C) curve showed four distinct stages of weight loss (0.8% 110–160°, 0.2% 500–550°, 0.8% 700–800°, 0.1% 850–950, interpolated by GYC).

Sample studied came from Khibina, USSR. Details on locality, occurrence, and mineral association are not given. **G. Y. C.**

"Yenshanite" (Pd, Pt)S

JEN YING-CHEN AND HUANG WAN-KANG (1973) On some new minerals and varieties of the platinum-group elements. *Geochimica*, **1**, 23–30 (in Chinese).

Six microprobe analyses gave (range and average): Pd 55.6–57.7, 56.5; Pt 17.4–19.4, 18.2; Ni—; S 21.8–23.9, 22.8; sum 95.0–99.8, 97.5 percent, corresponding to $(Pd_{0.85}Pt_{0.15})S_{1.13}$. The authors stated that the mineral differs from cooperite in Pd:Pt ratio, and from braggite and vysotskite in its absence of Ni. The mineral does not react with $HgCl_2$, $FeCl_3$, KCN, KOH, HCl, HNO_3 , and showed no sign of reaction after immersion in aqua regia for five minutes.

The mineral is tetragonal with $a = 6.41$ and $c = 6.60$ Å (space group not given). The X-ray pattern is essentially like that of synthetic PdS (XRPDF 10–429). Strongest lines (46 given) are 2.930 **8** 102; 2.867 **10** 201, 210; 2.670 **5** 112; 2.622 **8** 211; 1.870 **5** 222; 1.724 **6K** 312, 321; 1.150 **5** 404 (K = broad and/or diffuse).

The mineral occurs as well-formed, short-prismatic, tetragonal crystals with striations parallel to *c* on prismatic faces. {010} cleavage observed. Strong metallic luster. Non-magnetic. VHN(20 g load) ranged 520–770 kg/mm², average 610 kg/mm². Color in reflected light yellowish white. Reflectance *R*(percent): 420 nm, 36.5; 460 nm, 36.8; 500 nm, 42.0; 530 nm, 42.0; 590 nm, 43.0; 650 nm, 38.2. Weakly anisotropic.

The mineral was found in association with cooperite and braggite in a Cu-Ni sulfide-apatite deposit in ultra-basic rocks in China (no details on locality).

Discussion

The mineral is evidently a nickel-free vysotskite (*Am. Mineral.* 48, 708), and the name "yenshanite" is unnecessary. G. Y. C.

New Variety, (Pt, Pd, Ni)₂(Sn, Sb)₂

JEN YING-CHEM AND HUANG WAN-KANG (1973) On some new minerals and varieties of the platinum-group elements. *Geochimica*, 1, 23–30 (in Chinese).

Microprobe analysis of five points on different grains gave (range and average): Pd 9.2–11.9, 10.9; Pt 59.9–61.2, 60.5; Ni 3.6–4.8, 4.4; Sb 4.1–5.6, 4.8; Sn 16.6–19.1, 17.9; sum 97.0–99.9, 98.5 percent, corresponding to (Pt_{3.24}Pd_{1.07}Ni_{0.78})(Sn_{1.88}Sb_{0.42}). The mineral does not react with HgCl₂, FeCl₃, KCN, KOH, HCl, HNO₃, or aqua regia.

X-ray pattern of the mineral is stated to be essentially like that of (Pd,Pt)₇(Sn,Sb)₂. L. V. Razin and V. P. Bykov, 1971, *Zapiski Vses. Mineral. Obshch.* 100, 171–177) where the formula was actually given as (Pd,Pt)₇(Sn,Pb)₂. Six lines given: 2.520 2 111β, 2.285 10 111, 1.982 6 200, 1.420 4K 220, 1.198 5K 311, 1.150 3K 222, (K = broad and/or diffuse), indexed on the basis of a cubic cell with *a* = 3.98Å.

The mineral has one set of cleavage. Color lead gray; silver white on fresh surfaces with strong metallic luster; dark gray when oxidized. VHN (20 g load) ranged 510–640 kg/mm², average 590 kg/mm². In reflected light the mineral is yellow with a faint green tint. Isotropic. Reflectance: 420 nm, 46.5; 460 nm, 49.8; 500 nm, 57.6; 530 nm, 58.2; 590 nm, 59.0; 650 nm, 59.5 percent.

The mineral occurs as small grains (0.05–0.3 mm), in association with the unnamed mineral (Pd,Pt,Ni)₂(Sb,Sn), in a Cu–Ni deposit in a two-pyroxene peridotite in China (no details on locality).

Discussion

The mineral appears to be an antimonian variety of the unnamed mineral S (Cabri, *Mineral. Sci. Eng.* 4, 3–29, 1972) or the recently approved mineral rustenburgite Pt₃Sn (*Can. Mineral.*, in press). G.Y.C.

Unnamed Carbonate

KURT BOSTRÖM AND OIVA JOENSUU (1974) Distribution of Ba and Pb in primary carbonates in Langban, Sweden. *Geol. Foren. Forh.* 96, 375–379.

Analyses and X-ray data are given for carbonates associated with hausmannite. Recalculation of analyses on material containing calcite (content estimated from X-ray data) indicates the composition to be between (Ca_{0.37}Ba_{0.41}Mg_{0.19}Pb_{0.02})CO₃ and (Ca_{0.40}Ba_{0.42}Mg_{0.16}Pb_{0.02})CO₃. The X-ray data indicate a composition of (Ca_{0.35}Ba_{0.40})(Pb,Mg)_{0.25}(CO₃). X-ray data indicate a disordered rhombohedral carbonate with 4.00 20 102, 3.14 100 104, 2.56 12 110, 2.37 20 113, 2.153 20 202, 2.022 30 108, 1.949 20 116. M.F.

Unnamed Ce₂Ba₃(CO₃)₅F₂

WANG HSIEN-CHUEH, SHU HSIEN-TSE, KUO CHI-TI, LI SHAO-PING, AND WANG CHUNG-KANG (1973) Studies on barium rare-earth carbonate fluorides. *Ti Ch'iu Hua Hsueh (Geochimica)*, 1, 31–38 (in Chinese).

Two conventional chemical analyses gave: CaO 0.24, 1.89; MgO 0.31, 0.22; SrO 1.88, 0.37; BaO 40.57, 44.49; Fe₂O₃ 0.09, 0.20; Al₂O₃ 1.00,—; Ce₂O₃ 13.97, 15.84; RE₂O₃ 16.84, 16.05; ThO₂ 0.25, 0.13; SiO₂ 1.94, 0.15; CO₂ 19.62, 18.23; F 3.60, 3.54; H₂O⁺ 0.16, —; H₂O⁻ 0.36, —; —O = F₂ 1.51, 1.49; sum 99.32, 99.62 percent, corresponding to (RE_{1.98}Ca_{0.05}Mg_{0.08}Th_{0.01})(Ba_{2.81}Sr_{0.19})(CO₃)_{4.73}F_{2.01}(OH)_{0.19}, or ideally (Ce,La)₂Ba₃(CO₃)₅F₂. Distribution of rare earths (range for five analyses): La 27.7–32.4, Ce 45.4–54.3, Pr 3.9–4.9, Nd 10.2–15.7, Sm 0.7–1.1, Eu 0.1–0.3, Gd 0.3–0.7, Tb 0.07, Dy 0.1–0.2, Y 0.11–0.2 percent. The mineral dissolves easily in inorganic acids.

The X-ray powder pattern is indexable on the basis of a hexagonal cell with *a* = 4.96 and *c* = 20.20 Å. The strongest lines are (21 given, including 5β – lines): 3.97, 6, 102; 3.24, 10, 104; 2.126, 7, 201; 1.990, 7, 116; 1.367, 5, 218; 1.262, 5, 2·1·10; 1.089, 5, 3·0·12. The pattern is essentially similar to that of Huanghoite (*Am. Mineral.* 48, 1179, 1963) except that there are fewer high-2θ lines and in the pattern of Huanghoite a few corresponding lines are doublets.

The mineral occurs in a rare-earth-iron deposit of hydrothermal vitreous-greasy luster. It has a tabular habit, conchoidal fracture, and hardness 4.5. Sp. gr. = 4.46. Optically uniaxial (–), sometimes biaxial (–) with 2*V* = 5–10°. ω = 1.740–1.748, ε = 1.598–1.604.

TGA showed a weight loss of 13.9 percent between 670–710°C and a further loss of 1 percent on reheating to 980°C. DTA showed endothermic peaks at 683°C (strong, decomposition to CeO₂, BaF, BaCO₃), 778° (medium, phase change of BaCO₃), and 798° (weak shoulder).

The mineral occurs in a rare-earth-iron deposit of hydrothermal replacement origin, in meta-sediments in Northern China (no details on locality). It is associated with sodic pyroxene, fluorite, barite, and apatite. Cordylite and Huanghoite also occur in the same deposit.

Discussion

The mineral appears to be unique. In view of the strong similarity to Huanghoite in chemistry and powder pattern, single crystal X-ray work is desirable. G.Y.C.

Unnamed (Co,Fe)Se₂

LUIS A. DE MONTREUIL (1974) An unknown cobalt-iron selenide. *El Ingeniero Geol. Univ. Nacl. Mayor de San Marcos, Geol.* 16, 65–70 (in English).

Probe analyses, using Co, Fe, and Se as standards, gave after correction Se 72.95, 76.13; Co 14.33, 13.84; Fe 11.98, 11.96, sum 99.26, 101.93 percent, corresponding to Co_{0.53}Fe_{0.46}Se_{2.00}, and Co_{0.49}Fe_{0.45}Se₂.

Color in air bright yellowish-white with a slight pink tint. Birefractance strong, creamy to yellow. Anisotropy strong, in air brownish-yellow to brown, in oil yellowish-brown to brown. Reflectance at 589 nm, *R*_p 40.6, *R*_g 44.4 percent. Some grains show very fine lamellar twinning.

The mineral occurs as very fine star-shaped crystals, and also as subhedral and anhedral grains up to 100 microns in diameter, disseminated in calcite in samples from Habri near Tisnov, Western

Moravia, Czechoslovakia. Associated minerals include eskebornite, umangite, berzelienite, and eucairite.

Discussion

Apparently a dimorph of hastite. X-ray study is required. M.F.

Unnamed Palladian Antimonial Platinum Bismuthide

M. TARKIAN AND E. F. STUMPFL (1974) (Pt,Pd)(Bi,Sb), a new mineral. *Neues Jahrb. Mineral. Monatsh.* 1974, 514-517.

A new mineral was reported from Pt concentrates from the Driekop Mine, Transvaal. The concentrates also contain Pt-Fe alloys, sperrylite, geversite, hollingworthite, irarsite, and some other platinum-group minerals (PGM), including another new mineral, (Pt,Pd)₉Sb₂, still under investigation. The (Pt,Pd)(Bi,Sb) mineral is yellowish with respect to Pt-Fe alloy, birefractance is strong and varies from light yellow to brownish yellow. Anisotropism is strong, exceeding that of the associated PGM. Reflectances min. and max.: 440 nm, 46.2-51.0; 470 nm, 49.7-55.7; 480 nm, 50.7-56.5; 520 nm, 54.8-60.2; 546 nm, 56.2-62.0; 560 nm, 57.1-63.2; 589 nm, 59.4-66.4; 600 nm, 59.8-66.8; 640 nm, 62.6-68.8; 650 nm, 62.6-69.0; 680 nm, 62.4-69.9 percent. $VHN_{15,25} = 301-352$.

Microprobe analysis¹ gave Pt 36.7, Pd 10.7, Bi 32.1, Sb 16.2, As 4.4, Sn 0.8; sum 100.9 percent, corresponding to (Pt_{0.86}Pd_{0.36})(Bi_{0.53}Sb_{0.46}As_{0.20}Sn_{0.02}).² The small grain size (max. 35 μm) and complex intergrowth with other PGM have precluded X-ray analysis.

Notes

¹ No information on standards used.

² This formula was recalculated from the published analysis. The recalculated formula and stoichiometry of 1:1.21 are in contrast to the published formula and stoichiometry of 1:1.14.

Discussion

X-ray data are needed to verify whether the mineral is the antimonian variety of PtBi, in the same way that X-ray analysis has shown that type stumpflite (abstr. *Am. Mineral.*, 1974, 59, 211) is

the bismuthian variety of PtSb. (Since the name stumpflite applies to PtSb or to intermediate compositions of the series PtSb-PtBi with Sb > Bi). L.J.

Unnamed (Pd,Pt,Ni)₂(Sb,Sn)

JEN YING-CHEN AND HUANG WAN-KANG (1973) On some new minerals and varieties of the platinum-group elements. *Geochimica*, 1, 23-30 (in Chinese).

Microprobe analysis of five points on different grains gave (range and average): Pd 28.7-32.4, 30.6; Pt 35.2-39.1, 36.6; Ni 1.8-3.2, 2.2; Sb 26.1-27.6, 26.9; Sn 2.4-3.3, 2.8; sum 97.2-100.1, 99.1 percent, corresponding to (Pd_{1.18}Pt_{0.77}Ni_{0.16})(Sb_{0.90}Sn_{0.10}). The mineral does not react with HgCl₂, FeCl₃, KCN, KOH, HCl HNO₃. Aqua regia produces thin reddish-brown film along certain crystallographic directions.

The strongest X-ray lines (unindexed, 26 given including 6 β-lines) are 3.53 5, 2.980 10, 2.343 5, 2.243 9, 2.198 7, 2.164 8, 2.040 7.

Cleavage observed. Brittle. Metallic luster. VHN (10 g load) ranged 295-470 kg/mm², average 322 kg/mm². Color silver white with faint yellow tint on fresh surfaces and dark gray when oxidized. In reflected light the mineral is yellowish brown with rose tint. Strongly pleochroic: powder blue-gray-yellowish white. Reflectances R'g and R'p (percent) are 420 nm, 50.0, 35.0; 460 nm, 52.5, 40.3; 500 nm, 56.0, 46.5; 530 nm, 61.0, 46.8; 590 nm, 63.0, 58.0; 650 nm, 63.0, 60.0. Birefractance yellowish white to yellowish brown.

The mineral was found in small grains (0.05-0.1 mm) in the heavy fraction of crushed ore from a Cu-Ni deposit in a two-pyroxene peridotite in China (no details on locality).

Discussion

The mineral is apparently the Sb-analog of Paolovite (*Am. Mineral.* 1974, 59, 1331). Further studies are necessary, especially single-crystal work and synthesis. G.Y.C.

NEW DATA

Usovite

A. S. POVARENENYKH, L. N. EGOROVA, A. L. LITVIN, AND A. D. NOZHKIN (1974) Chemical composition and unit cell of usovite. *Dopovidi Akad. Nauk Ukr RSR*, 36 B, no. 10, 891-893 (in Ukrainian).

The original description of usovite (*Am. Mineral.* 52, 1582, 1967) stated that it was probably orthorhombic, and that the material analyzed, which gave the formula Ba₂CaMgAl₂F₁₂, probably contained fluorite, so that the true formula was considered to be Ba₂MgAl₂F₁₂.

X-ray study now shows the mineral to be monoclinic, space group C2/c or Cc, a 13.565, b 5.200, c 14.557 Å, β 91°21', V = 1028.0 Å³. With Z = 4, the formula Ba₂MgAl₂F₁₂ gives G calc 4.00;

the formula Ba₂CaMgAl₂F₁₂ gives G calc 4.26. The measured G is 4.18, and so the formula is taken to be Ba₂CaMgAl₂F₁₂. M.F.

Zincibraunite

MARIA KULIG (1972) Hydrohetaerolite from the Orzel Bialy mine (Upper Silesia) and the problem of zincibraunite. *Minerals. Polonica*, 3, 55-66.

Material from the title mine gave an analysis close to that of the doubtful mineral zincibraunite (*Dana's System*, 7th Ed., v. 1, p. 573). X-ray and DTA study showed that the main constituent was hydrohetaerolite.

Discussion

This is not the type material. M.F.

ERRATA

Typographical errors noted by Carl Francis, Virginia Polytechnic Institute and State University: *Am. Mineral.* 58, 347 (1953) Berndtite-6C should read Berndtite-

C6. *Am. Mineral.* 59, 1139 (1974) The space group for drysdallite should be P6₃/mmc.