New Mineral Names*

MICHAEL FLESCHER, LOUIS J. CABRI AND ADOLF PABST

Franzinite*


Microchemical analysis gave SiO2 32.44, Al2O3 25.21, Fe2O3 8.04, MgO 0.14, CaO 12.08, Na2O 11.50, K2O 4.24, SO3 10.65, CO2 1.54, Cl 0.36, O2 1.88, sum 100.08, (OS = Cl) 0.08 = 100.00 percent. “SiO2 and Al2O3 were determined by X-ray fluorescence, account being taken of the proper correction factor for S and Cl and assuming that the weight percentages sum up to 100.0.” This gives the unit-cell content: (Na1 urCa, uoMgo roFoo or) 0.04, MgO 0.14, CaO 12.08, Na2O 11.50, K2O 4.24, SO3 10.65, CO2 1.54, Cl 0.36, O2 1.88, sum 100.08 - (OS = Cl) 0.08 = 100.00 percent.

Weissenberg and precession photographs show the mineral to be hexagonal, space group P3ml, P3m1, or P321, a 12.884 ± 0.009, c 4.31 ± 0.004. The strongest X-ray lines (30 given) are 4.83 (3lXll0), 3.81 (42X110), 3.72 (100)(300), 3.59 (43)(107), 3.56 (39)(214), 2.148 (29)(330). The mineral occurs as squat pearly white prisms up to 1 cm in diameter. G 2.49 meas, 2.52 calc. H 5. Optically uniaxial positive, u 1.510, c 1.512. It occurs with afghanite and liottite [Am. Mineral., 62, 321, (1977)].

Electron probe analyses gave Zn 23.6, 23.6, As 53.7, 53.4 percent; microchemical analysis gave ZnO 28.5, FeO 0.5, As2O3 71.4 percent, corresponding to ZnAs2O4 (zinc arsenite). DTA and TGA curves are given. When the mineral is heated, part of the As2O3 is lost, part is oxidized (formation of Zn2(AsO4)2). The DTA curve in air shows a small endothermic peak at 507°C (loss of As2O3) and a large one at 576°C; in N2 there are 2 endothermic peaks at 509°C and 546°C. Incongruent melting occurs at 900-1000°C.

Leiteite*


Six microprobe analyses gave (range and av.): As2O3 44.96-45.68, 45.36; CuO 16.84-20.22, 18.81; ZnO 16.78-18.37, 17.90; CdO 13.58-14.93, 14.08; CaO 0.41-1.11, 0.80; PbO 0.14-1.42, 0.63; MnO 0.79-1.27, 1.07; sum 97.81-99.54, 98.65 percent, corresponding to (Cu,Zn,Cd)(AsO4)2 with Cu:Zn:Cd = 1.19 ± 0.05. The mineral is readily dissolved by concentrated acids.

The mineral occurs as crystals (max. 0.25 x 0.1 x 0.04 mm), prismatic [001] to tabular [010], showing forms (010), (102), (101), perhaps (011). Cleavage [001] good. Color deep sky-blue, streak pale blue. H 3 1/2-4. Optically biaxial, sign and 2V not determined, a 1.80, γ 1.87, β = 1.80, strongly pleochroic, X pale blue, Y greenish blue, Z deep blue, absorption Z > Y > X. Dispersion strong, Xα = 10.50° (Cd red), 15° (Hg yellow), 125° (Hg green), 91° (Hg violet).

The mineral occurs in cavities in tennantite ore from Tsumeb, S.W. Africa, associated with schullenite and zincline olivenite. The name is for Charles L. Key, mineral dealer, of Canton, Connecticut, who first called attention to the mineral. Type material is in the British Museum, London. Note Keyite is similar in composition and appearance to stranskiite [Am. Mineral., 45, 1315 (1960)], but the symmetry and strongest X-ray lines are different. M.F.
name (pronounced la’tit) is for Luis Teixeira-Leite, mineralogist, Pretoria, S.W. Africa, who first found it. Type material is at the Smithsonian Institution, British Museum, and the Paul and Marie Curie University, Paris. M.F.

Machatschkiite*
K. Walenta (1977) Machatschkiit, ein neues Arsenmineral aus der Grube Anton im Heubachtal bei Schiltach (Schwarzwald, Bundesrepublik Deutschland).


Chemical analysis, following recalculaton, gave CaO 29.5, As₂O₅ 40.8, SO₃ 0.5, H₂O 29.2, sum 100.0 percent, in good agreement with the formula Ca₀.ₙ(As₂O₅)₀.ₙ·11H₂O. Machatschkiite is rhombohedral, the characteristic form being (1012); the dimensions of the hexagonal unit cell are a 15.10, c 22.59 A, Z = 12, G = 2.30. The diffraction factor is R* = 2.2. The strongest lines in the powder pattern are 8.89 (10(012)), 5.34 (8(112)), 3.59 (8(1314)).

Machatschkiite dissolves readily in dilute HCl or HNO₃. There is no cleavage, fracture is conchoidal, H = 2-3. The mineral is colorless, translucent to transparent, weakly biaxial negative, ε = 1.585(2), ω = 1.593(2). It occurs as a secondary mineral in crusts on gyspum, pharmaclorite, pyropharmacolite, and saffeldite.

The name is for the late Felix Machatschki, professor of mineralogy successively at Tübingen, Munich, and Vienna. A.P.

Majakite*

Microprobe analyses of two grains gave Pd 41.3, 41.2; Ni 27.0, 27.4; As 31.0, 30.9; sums 99.3, 99.5, corresponding to Pd₉₉.₉₅Ni₄₉₅As₀₇₅ and Pd₉₅.₉₅Ni₄₉₅As₀₇₅ (recalculated on basis of 3 atoms by L.J.C.) The ideal formula is either PdNiAs or (Pd,Ni)As. Traces of Bi were found (not quantified) and other elements, with detection limits 0.1-1 weight percent, were not detected.

The X-ray powder pattern compares closely with that of synthetic PdNiAs and was indexed as hexagonal a = 6.066, c = 7.20 A: strongest lines for the mineral are 2.65 (10(012)), 2.30 (5(112)), 2.19 (7(1013)), 1.98 (8(1012)). For Z = 6, ρ(calc) = 10.5 g/cm³ and ρ (meas) = 9.33 g/cm³ for synthetic PdNiAs.

Majakite was found only as intergrowths with other platinum-group minerals in the chalcopryite and talnakhite ores of the Majak mine, Talnakh deposit, Majakite often occurs as rounded or oval inclusions (0.001-0.1mm) in polarite and also as intergrowths with stannopalladinite. In some cases it occurs as part of more complex intergrowths containing a large number of platinum-group minerals. In reflected light majakite appears grayish-white, but it is lilac-gray when intergrown with native silver, distinctly rosy with a greenish tint with polarite, and grayish-white with a greenish tint with stannopalladinite. Birefringence was not observed in air or in oil. It is weakly anisotropic, with a greenish tint with stannopalladinite. Birefringence was not observed in air or in oil. It is weakly anisotropic, with a greenish tint with stannopalladinite. Birefringence was not observed in air or in oil. It is weakly anisotropic, with a greenish tint with stannopalladinite. Birefringence was not observed in air or in oil. It is weakly anisotropic, with a greenish tint with stannopalladinite. Birefringence was not observed in air or in oil.
100.4 percent, corresponding to \( \text{Pd}_{2+\alpha}\text{Bi}_{1+\beta}\text{Pb}_{2+\gamma} \) or \( \text{Pd(\text{Bi},\text{Pb})} \).

The X-ray powder pattern (18 lines) was indexed on a hexagonal cell \( a = 13.82(1), c = 6.53(1) \text{\AA} \) with strongest reflections 2.643(10)

Urvantsevite was found in the massive pentlandite-cubanite-chalcopyrite ores in the roof of the zoned sulfides of the Majak mine, Talmakh deposit, at the contact with taxitic gabbro-dolerite. These sulfide ores are enriched in lead minerals (galena, altaite, shadulinite) and in platinum-group minerals. Urvantsevite occurs in irregular polymineralic intergrowths up to 4 mm in size. The central part of such intergrowths usually consists of unnamed \((\text{Pd},\text{Pt},\text{Cu})\)Sn bordered by consecutive intergrowths of froodite and urvantsevite (as irregular rounded or elongated gains 0.1-0.4 mm), sobolevskite(?), followed by paolovite, native silver and an outer rim of intergrown altaite and galena.

Urvantsevite polishes well and has a very perfect cleavage in one direction. VHN\(_{s} = 53(4), \text{VHN}_{o} = 50(2), \text{VHN}_{o} = 38(3). \) In polished section urvantsevite is grayish-white, usually darker than froodite, and when intergrown with sobolevskite(?) a greenish-yellow tint is noted. Urvantsevite is weakly bireflectant and slightly isotropic or weakly anisotropic, with no visible color effects. Reflectance (%) for \( R'g \) and \( R'p \) 440nm 48.7 and 50.5, 460nm 53.2 and 54.9, 480nm 54.6 and 53.8, 500nm 54.1 and 53.3, 520nm 54.8 and 53.7, 540nm 55.2 and 54.0, 560nm 56.2 and 54.9, 580nm 56.7 and 55.2, 600nm 57.6 and 56.1, 620nm 58.3 and 56.8, 640nm 59.2 and 57.8, 660nm 60.1 and 58.6, 680nm 60.9 and 59.6, 720nm 61.3 and 59.6. The mineral is etched by HNO\(_3\):(1:1) to an intense dark brown, blackens with concentrated HNO\(_3\). 10 percent FeCl\(_2\) blackens the mineral while 10 percent KCN + 5 percent NaOH solution browns it slightly.

The mineral is named after Professor N. N. Urvantsev who first discovered the Noril'sk deposits. Polished sections with urvantsevite are preserved in the Mining Museum of the Leningrad Mining Institute.

Discussion

The calculated density is 9.6g/cm\(^3\), but was not reported by the authors. This value is rather low when compared to froodite (11.5g/cm\(^3\)). The mineral's powder pattern was indexed without single-crystal studies, as single crystals were not available. This is unfortunate in view of the close chemical relationship to froodite, especially since synthetic experiments were not made to determine whether, indeed, the mineral is a new species in the ternary Pd-Bi-Pb system. The following are corrections which should be made to the powder data: \( d(\text{calc}) = 3.265, 3.250 = 2.746, (8080) = 1.496 \text{A}, \) and \( k/hl \) for 1.187A is (4484) not (4482). L.J.C.

Unnamed Na-U-borate sulfates, unnamed Mg-borate


The minerals were found as incrustations on anhydrite, gypsum, hexahydrate, starkeyite, and loeweite. The magnesium borate occurs in more or less colorless crystals, apparently orthorhombic. Microchemical tests showed borate, Mg, and a little Na. Optically biaxial, neg., \( 2V<30^\circ, \gamma = v, \alpha = 1.442, \gamma = 1.504, \) both \( \pm 0.002. \) The strongest X-ray lines (31 given) are 12.08 (9), 7.60 (10, d), 5.29 (7), 3.93 (8, d), 3.09 (6), 2.68 (9).

Uranium mineral A contains Na, Mg, U, borate, and sulfate. It is yellow and fluoresces bright yellow-green in UV. It is decomposed by water. Optically negative, nearly uniaxial, \( \alpha = 1.496, \gamma = 1.512 (\pm 0.002), \) pleochroism weak, \( X \) colorless, \( Z \) yellowish. The strongest X-ray lines (50 given) are 10.84 (10), 9.80 (8), 9.06 (5), 7.89 (9), 7.03 (7), 4.85 (7).

Uranium mineral B may be a variety of or a different hydrate of mineral A, which it resembles in form, color, fluorescence, and qualitative chemistry. Optically biaxial, neg., \( 2V<30^\circ, \alpha = 1.476, \gamma = 1.496 (\pm 0.002), \) pleochroism weak, \( X \) colorless, \( Z \) yellowish. The strongest X-ray lines (58 given) are 10.79 (9), 9.80 (10), 8.52 (7), 7.70 (9, d), 6.42 (6), 5.27 (5) 4.85 (7, d), 4.29 (6), 3.06 (6), 2.88 (5).

Uranium mineral C occurs in pale yellow long-prismatic crystals, apparently triclinic. Twinned. Fluorescence like that of minerals A and B. Optically biaxial, neg., \( 2V<17-27^\circ, \) variable, extinction \( \sim 28^\circ, \alpha = 1.473, \gamma = 1.490 (\pm 0.002). \) Microchemical tests also show Na, Mg, U, borate, sulfate. The strongest X-ray lines (48 given) are 9.88 (10, d), 7.98 (8), 7.42 (6), 4.87(6), 3.91 (6), 3.67 (5), 2.84 (5, d). M.F.

Unknown (Pd, Ni, As) mineral

L. J. Cannr et al. (1975) ibid.

One grain of this mineral was found in a complex intergrowth with kotulskite, an "unnamed (Pd, Cu, As) mineral", and palladooarsenide from the Stillwater Complex, Montana. It is light yellow to grayish under reflected light in oil immersion. It is either isotropic or weakly anisotropic. Electron microprobe analysis gave: Pd 48.6, Ni 17.4, As 32.7, Te 0.38, total 99.08 weight percent.

These data suggest a formula of (Pd, Ni)(As, Te) or PdNi(As, Te).

Discussion

I would like to object to the use of terms such as "unknown (Pd, Ni, As) mineral" or "unnamed (Pd, Cu, As) mineral" on several grounds. First, if the mineral is being studied it is not unknown; it is perhaps unidentified. The term "unknown" is used in this way by many mineralogists (this abstractor included), but it should be avoided. A much more important objection is the form in which the elemental symbols are given. At first glance, the expression (Pd, Ni, As) implies a native palladium with minor nickel and arsenic in substitution. I would suggest that "unnidentified Pd-Ni-As mineral" might better convey the proper relationship.

With regard to the formulae given by the authors, some other interpretations are possible. If As + Te is taken as 100, then the formula is Pd\(_{0.84}\)Ni\(_{0.17}\)As\(_{0.83}\)Te\(_{0.17}\). The value for Ni suggests that a better sum for As + Te would be 3.00, which gives a formula of Pd\(_{0.82}\)Ni\(_{1.18}\)As\(_{0.82}\)Te\(_{0.18}\). This could be interpreted as either Pd\(_{1.84}\)Ni\(_{0.16}\)As\(_{0.84}\)Te\(_{0.16}\) or (Pd, Ni)\(_{2}\)As\(_{3}\)Te\(_{4}\). J.A.M.

Discredited Minerals

Nenadkevite = a mixture


Nenadkevite, a uranium silicate, was described in 1956 [Am. Mineral., 42, 441-442(1957)], where I commented "an unnecessary name for what is probably a variety of coffinite." Reexamination of "ore and museum samples of nenadkevite from several Pre cambrian ore showings" by microprobe analyses (13) and X-ray...
data show them to be mixtures of uraninite (relict), boltwoodite, and "uranium hydroxides."

Discussion

It is not stated whether any of these samples is from the never-identified type locality. M.F.

New Data

Deerite


"The pseudosymmetric space group of deerite in which the average structure has been determined is \textit{Pnma} (a = 18.872, b = 3.186, c = 10.278 A). By a superstructure, b is tripled (9.558 A) and the cell shows a slight monoclinic distortion (\(\alpha = 90.43^\circ\)), suggesting that the monoclinic axis is not \(\gamma\) fiber axis, as previously suggested.

From new microprobe analyses we came up with a tentative formula Fe\textsubscript{0.6} r"Mno."\textsubscript{0.4}Si\textsubscript{0.6} (O,OH)\textsubscript{0.5} (considering a density of 3.837 g/cm\textsuperscript{3}). In contrast to the original description, no Mg and only traces of Al could be detected."

Ktenasite


Discussion

The probe analysis is not given. The formula as given is unsatisfactory since it does not indicate that approximately equal amounts of Fe\textsuperscript{3+} and Fe\textsuperscript{2+} are present. M.F.

Ktenasite from Glomsrudkollen zinc mine, Modum, Norway, is monoclinic, space group \(P2_1/c\), with \(a = 5.598, b = 6.121, c = 23.762\ A, \beta = 95.55^\circ\). The formula, calculated from an analysis, is \((\text{Cu},\text{Zn})\textsubscript{1.9}(\text{SO}_4)\textsubscript{2}(\text{OH})\textsubscript{6}\cdot 6\text{H}_2\text{O}; Z = 2, G (calc) 2.96, (meas) 2.94.

Ktenasite is biaxial negative with \(\alpha\) (colorless) 1.574, \(\beta\) (bluish green) 1.615, \(\gamma\) (light green) 1.628, 2\(\nu\) 59\(^\circ\). The strongest lines of the powder pattern are 11.82 (100), 5.93 (85), 4.85 (90), 3.955 (50), 2.785 (60), 2.668 (60), 2.655 (50), and 2.584 (70). In the initial description (*Am. Mineral.*, 36, 381) the \(a\) axis dimension was double that now reported and the record of the powder pattern included many lines not attributable to ktenasite. A.P.

Wolframio-ixiolite


Wolframio-ixiolite was described in 1969 (*Am. Mineral.*, 55, 318-319 (1970)): the mineral was not accepted by the IMA Commission. The first paper cited above reexamines type material and gives infrared data, indicating the presence of hydroxyl ion and of molecular water. It also gives electron microprobe traverses that show small amounts of microcline, ilmenite, zircon, and rutile, and of a major phase containing Nb, Ta, and Mn, but no W. The conclusion: "As to whether wolframio-ixiolite is a new mineral with formula \((\text{Fe,Mn})\textsubscript{2}\text{Ta}_2\text{O}_6\) or an unusually close intergrowth of two minerals, (Fe,Mn)WO\textsubscript{4} and (Mn,Fe) (Nb,Ta)\textsubscript{2}O\textsubscript{6}, remains an open question."

The second paper gives two electron probe analyses of homogeneous inclusions in cassiterite from a Sn–W deposit of Yakutia. One of these, referred to as wolframio-ixiolite, containing Nb\textsubscript{38.1}, Ta\textsubscript{30.9}, SnO\textsubscript{4.0}, WO\textsubscript{27.9}, TiO\textsubscript{2.6}, MnO\textsubscript{2.0}, FeO\textsubscript{3.5}, UO\textsubscript{1.1} percent, leading to the formula \((\text{Nb}_{0.38}\text{Ta}_{0.30}\text{W}_{0.38}\text{Sn}_{0.40}\text{Mn}_{0.04}\text{Sn}_{0.03}\text{U}_{0.01})\text{O}_6\).

Discussion

X-ray data are required, but even if this is an ixiolite, it is a tungstenian variety, and the name is unnecessary. M.F.

Yuksporite


Yuksporite was described by Fersman (1923) (*Am. Mineral.*, 12, 58 (1927)) as a hydrous silicate of Ca, Na, and K. Four later analyses by Kostyleva (*Mineralog. Abstr.*, 3, 111-112: 6, 285), show considerable variation of SiO\textsubscript{2} (37.2–55.4), TiO\textsubscript{2} (4.1–15.4), CaO (18.8–23.4), Na\textsubscript{2}O (5.1–12.9), K\textsubscript{2}O (2.5–8.0), and H\textsubscript{2}O (7.8–5.6%).

The present paper gives a new complete analysis (SiO\textsubscript{2} 39.16, TiO\textsubscript{2} 9.04, CaO 14.70, SrO 3.39, BaO 7.52, Na\textsubscript{2}O 6.16, K\textsubscript{2}O 7.13, H\textsubscript{2}O + 2.84%). The infrared spectrum indicates that yuksporite is not related to pectolite nor to xonolite, but may be related to the astrophyllite group and bafertisite. The formula is given as \((\text{Na,K})\textsubscript{0.5} (\text{Ca,Sr,Ba})\textsubscript{0.5} (\text{Ti,Al,Fe})\textsubscript{0.5} \text{Si}_2\text{O}_5 (F,Cl)\approx 0.79\text{H}_2\text{O}.

Discussion

Apparently a valid species. Better X-ray powder data and a unit-cell determination are needed. M.F.