NEW MINERAL NAMES*

MICHAEL FLEISCHER, GEORGE Y. CHAO AND ADOLF PABST

Bahianite*


Bahianite occurs as water-worn pebbles ('favaes') with quartz, andalusite, kyanite, diaspore, eskolaite, cassiterite, etc., in the Paramirim region, south-central Bahia state, Brazil. The average of four wet-chemical and microprobe analyses gave Sb2O5 21.7, Al2O3 35.37, Fe2O3 1.04, WO3 1.03, H2O+2.77, sum 99.44 Vo, leading to the formula for a series Al,O1.35, Fe,O0.1, WOg 1.20, BeO 0.75, SiO2 1.03, HrO+1.81, B = 1.87, ^r : 1.92, r > v. The name is for the State of Bahia.

The crystal structure has been previously described; see P. B. Moore and T. Araki: Bahianite, Al6Sb3+Orr(O,OH)2, a novel hexagonal close-packed oxide structure; Neues Jahrb. Mineral. Abh., 126, 113-125, 1976 (Mineral. Abstr., 77-882). A.P.

Boyleite*


Microchemical analysis by the Fresenius Laboratory gave SO4 39.76, ZnO 29.25, MgO 2.82, CaO+H2O (by difference) 28.17%. After deducting 11.6% gypsum, this corresponds to (Zn0.88Mg0.12)SO4.4H2O. Dissolved by water. Slowly dehydrates in a dry room to gunningite.

X-ray powder data are given (49 lines); strongest lines are 4.06(6)(110), 2.67(8)(120), 2.63(10)(101), 2.04(6)(220), 2.01(6)(121), 1.915(10)(130,211), 1.209(6)(150,411). Crystals are prismatic tabular (20 x 7μm), elongated along b. There is one cleavage parallel to elongation. The mineral is brittle, dull steel gray with a metallic luster. It polishes well. Under reflected light the mineral is white with a yellow tint in air, milky yellow in oil. It is distinctly anisotropic and weakly bireflectant, yellow to grayish yellow. Reflectances (Ri and Rj) are: 40.49, 40.15 (546); 42.15, 42.06 (589); 46.35, 48.93% (656nm). The mineral is insoluble in HCl and HNO3, and dissolves with difficulty in aqua regia.

The mineral occurs with sudburyite, antimoniterian michenerite, hexastibiotanackehite (Am. Mineral., 61, 182, 1976), sperrylite, and kotulskite in a pyrrhotite-pentlandite-violarite-gersdorffite-chalcopryite deposit associated with an altered ultramafic body in Sichuan (Szechuan), China. The name is for Omeishan, a well-known mountain in the province. Type specimens are preserved in the collections of the Museum of Geology, National Bureau of Geology (Peking!). G.Y.C.

Sasaite

Sasaite occurs as white chalky nodules in the soil of a dolomitic cave, apparently derived from the action of bat guano on clay minerals. It consists of an aggregation of rhombic plates 10-20 μm in greatest dimension. Wet-chemical analysis gave: Al2O3 21.65, Fe2O3 1.05, MnO 0.01, MgO 0.07, CaO 0.12, SrO 0.02, SO3 2.77,
P₂O₅ 24.16, H₂O 49.50, F 0.03, insol. 0.07, sum (less O for F) 99.44 percent, leading to the simplified formula (Al,Fe²⁺,Mg)₂₄(PO₄)₉₂(Al,Fe²⁺)₃₆(OH)₈SO₄·83H₂O. A diffractometer pattern has been indexed on the basis of an orthorhombic cell with a = 21.50, b = 30.04, c = 92.06A, Z = 10, D(calc) 1.747, (meas) 1.75. Principal lines of the powder pattern are: 11.52 100, 5.21 22, 6.99 23, 6.30 21, 2.901 42. Refractive indices are α = 1.465, β = 1.473, γ = 1.477. At ambient temperature saasite loses water rapidly, about 12% of total weight in ordinary atmosphere, 22% in a silica-gel desiccator. After two weeks it hydrates entirely again in a water-saturated atmosphere. The name is derived from South Africa Speleological Association, the members of which explored West Driefontein Cave for the first time and discovered the mineral. A.P.

**Tlapallite***


Tlapallite was first recognized as a new mineral in 1972 at the Bambollita (La Oriental) mine near Montezuma, where it occurs as thin paint-like films on rock fractures in and adjacent to thin veins cutting intensely sericitized rhyolites. Recently it has also been found in old specimens from Tombstone, Arizona. Data for type (Mexican) material: color viridian green RHS-12gA with pleochroic lines: λ 1.972(10)100; 2.985(10)313, 2.223; 3.540(6)302, 2.211, 311; 5.946(5)012; 2.887(5)313, 131, 115, 124. Similar data were obtained for the Tombstone material, which also yielded a better analysis: Cu₄.43, PbO 14.3, CuO 15.8, ZnO 0.7, TeO₂ 44.3, TeO₃ 12.5, SO₂ 5.57, H₂O 4.25, sum 101.02%, leading to the formula H₄(Ca,Pb₂)(Cu,Zn)(SO₄)(TeO₂)(TeO₃); for Z = 4 D(calc) = 2.565, G(meas) = 5.38. Characterized by extreme birefringence; for Mexico α = 1.815, β = γ = 1.990, for Tombstone α = 1.915, β = γ = 2.115. The name is taken from the Nahua word tlapalli, meaning paint, in allusion to the mode of occurrence. A.P.

**Túcèkite***


Túcèkite, Ni₅Sb₅S₆, was found as microscopic grains in a mineralized Alcanite chalcocite schist at Kanowna, Western Australia, and in gold-bearing conglomerates from at least two localities of the Witwatersrand System, South Africa. At Kanowna túcèkite occurs as rims and irregular grains partly replacing millerite and is associated with pyrite, chalcocyprite, gersdorffite, pentlandite, magnetite, and supergene polydymite. In the Witwatersrand the mineral was found in concentrates as rare free grains or intergrown with gold or supergene polydymite. In the Witwatersrand System, South Africa. At Kanowna túcèkite occurs as rims and irregular grains partly replacing millerite and is associated with pyrite, chalcocyprite, gersdorffite, pentlandite, magnetite, and supergene polydymite. In the Witwatersrand the mineral was found in concentrates as rare free grains or intergrown with gold or supergene polydymite. The mineral is opaque, pale yellow, with metallic luster. Under the microscope in reflected light it is pale brownish-yellow; reflectivity high. Indentation hardness 718 kg/mm² (20 g load); 417 kg/mm² (10 g load). Best microprobe analysis from Kanowna gave: Ni 47.34, Co 1.06, Fe 3.61, As 0.86, Sb 21.62, Te 0.30, Bi 1.84, S 25.19, sum 101.81%, and the average of several microprobe analyses of material from Witwatersrand gave: Ni 47.80, Fe 3.75, As 1.34, Sb 21.87, Bi 1.02, S 25.13, sum 100.91%. A powder pattern of túcèkite from Witwatersrand, indexed by analogy with hauchecornite, gave the tetragonal cell dimensions a = 7.174, c = 5.402A; D (calc) = 6.15 g/cm³ with Z = 1. The name is in honor of Dr. Karel Túcèk, Curator of Minerals at the National Museum in Prague, Czechoslovakia. A.P.

**Uranospathite and arsenuranospathite***


Reinvestigation of uranospathite from the type locality, Redrub, Cornwall (Hallimond, *Mineral. Mag.,* 17, 221-236, 1915) shows that it is an aluminum uranyl phosphate belonging to the torbernite series but more highly hydrated than other members thereof. The composition (Al₆O₁₈)(UO₂)(PO₄)₂·2OH₂O was derived by indirect methods and from a microprobe analysis showing 2.6% Al₂O₃ in partly dehydrated material.

Arsenian uranospathite occurs at Menzenschwald in the southern Black Forest. Arsenuranospathite proper is a new mineral found at Menzenschwald and also at Wittichen in the central Black Forest. It is the aluminum uranyl arsenate corresponding in formula to uranospathite. It is found in white to pale yellow lathlike or wedge-shaped crystals of orthorhombic habit with perfect (001) cleavage and good (100) and (010) cleavages.

Though both minerals are biaxial negative, and this is presumably the reason for reference to {100} and {010} cleavages, they are assigned to a tetragonal space group, P₄/n. For uranospathite: a = 7.02, c = 30.02A, Z = 2; D(calc) = 2.49 g/cm³; α = 1.492(2), β = 1.511(2), γ = 1.521(2), 2V(−) = 76°; for arsenuranospathite: a = 7.16, c = 30.37A, Z = 2, D (calc) = 2.54 g/cm³; β = 1.538, γ = 1.542(3), 2V(−) = 52°. Both minerals convert readily to a lower hydrate, that in the case of partly dehydrated uranospathite is identical with sabugalite. Cell dimensions for the lower hydrate formed from arsenuranospathite, with 10H₂O per formula unit as here stated, are a = 7.15, c = 20.52A, Z = 2, D (calc) = 2.60 g/cm³; α = 1.564 colorless, β = 1.594, γ = 1.596 yellowish, 2V ca. 28°. The designations arsenuranospathite I, II, and III are proposed for the 20, 16, and 10H₂O hydrates, the 16H₂O hydrate being known only as a synthetic product. A.P.

**Whiteite***


Whiteite occurs with other phosphates along joints and fractures in quartz and albite on numerous specimens from Ilha de Taquaral, Minas Gerais, Brazil, in crystals up to 2cm. Rather pure material also occurs in a sideritic iron-formation in the Fish River—Blow River area of NE Yukon Territory. Analysis of the Yukon whiteite yielded Na₂O 0.17, CaO 5.98, MgO 12.55, MnO 0.45, FeO 9.57, Al₂O₃ 11.54, FexO 0.25, P₂O₅ 37.68, H₂O 10.35, H₂O₊ 11.21, sum 99.75 percent, leading to the formula Ca(Fe,Mn)r⁺(PO₄)₉₂·rOH₂O. Analyses are also reported for Ca-poor and for Mn-rich types of whiteite. Whiteite crystallizes in the space group P₂₁/a; cell dimensions for that from Minas Gerais are: a = 14.90(4), b = 6.98(2), c = 10.13(2), α = 113°07′(10), β = 2; G = 2.58; strongest lines in the powder diffraction pattern are: 9.270(100)001; 4.822(65)111; 4.657(65)002; 2.941(70)403; 2.781(80)022. The crystals are tan colored; refractive indices are: α = 1.580(3), β = 1.585(3), γ = 1.590(3); 2V(+) = 40–50°, X || b,
Y || a. Properties of Ca-poor whiteite differ but slightly. The name is for Mr. John S. White, Jr. of the Smithsonian Institution.

Whiteite is the Al⁺⁻-analogue of jahnsite, and the following nomenclature is proposed on the basis of site occupancies in the structure: \( X(M(1)) \{M(2) \{M(3) \text{OH} \} \} \{H_2O \} \{PO_4 \} \), whiteite if \( Al^{3+} \rightarrow Fe^{3+} \) in \( M(3) \) and jahnsite if \( Fe^{3+} \rightarrow Al^{3+} \) in \( M(3) \). Established approaches to end-member compositions include: whiteite-(CaFe⁺ Mg) (type), whiteite-(Mn⁺⁺Fe⁺⁺Mg), jahnsite-(CaMn⁺⁺Fe⁺⁺), and possibly jahnsite-(Mn⁺⁺Mn⁺⁺Mn⁺⁺) (Pala). A.P.

Discussion

The indices of refraction (measured to ±0.003 on zoned material) are those of a biaxial, negative mineral with large 2V. M.F.

Xiangjiangite


Chemical analysis, before and after deduction of insolubles and admixed quartz and pyrite, gave \( UO_2 \) 56.24, 59.96; \( Al_2O_3 \) 0.90, 0.96; \( Fe_2O_3 \) 2.04, 2.17; \( CaO \) 0.26, 0.28; \( P_2O_5 \) 8.15, 8.69; \( SO_3 \) 5.65, 6.02; \( H_2O \) 9.86, 10.51; \( H_4O \) 10.70, 11.41; \( SiO_2 \) (quartz) 4.42, 4.46; \( Fe \) (pyrite) 0.15; 0.20; \( As \) 0.13, 0.16; insol 0.46, 0.49; sums 99.16, 100.00 wt%. The analysis corresponds to \( 2.88g/cm^3 \), is more in line with the observed values, 2.9-3.1g/cm³. The fact that the sum of P and S atoms approaches 4 per formula suggests an unusual substitutional relationship between P and S. The balancing of charges is probably accomplished by varying the amount of OH present. The generalized formula may be written as \( (Fe,Al)(UO_2)(PO_4)(SO_4)(OH)_{22}H_2O \). G.Y.C.

NEW DATA

Xanthoxenite


The mineral named xanthoxenite by Laubmann and Steinmetz (Z. Kristallogr., 55, 523-585, 1920), authentic examples of which cannot be located, is probably stewartite (in part) on the basis of morphological, optical, physical, and paragenetic evidence. It is proposed that the xanthoxenite of Frondel (Am. Mineral., 34, 692-705, 1949) from the Palermo No. 1 mine, North Groton, New Hampshire, be adopted as the specific term and that his material be defined as the neotype, having the probable composition \( Ca_2Fe^{3+}_2(UO_2)_2(PO_4)_3(SO_4)_3(OH)_8 \cdot 24H_2O \). A.P.

DISCREDITED MINERALS

Dehrite and lewistonite = Carbonate-fluorapatite


X-ray and microprobe examination of type dehrite from Dehrn, Germany, and of dehrite from Fairfield, Utah, shows this mineral to be a carbonate-fluorapatite. Similar examination of the apatite mineral labelled englishite-analyzed (from the Harvard collection, but presumably interchanged with Fairfield “lewistonite”) and of seven topotype “lewistonites” indicates that they, too, are carbonate-apatite.

The sodium and potassium content originally reported for dehrite and lewistonite is now attributed to contaminants. A.P.

Salmonsite = Hureaulite + jahnsite


W. T. Schaller described salmonsite as a new mineral from the Stewart mine, Pala, San Diego County, California (J. Wash. Acad. Sci., 2, 143-145, 1912). His type material cannot be located, but salmonsite from the same locality examined by D. J. Fisher (Am.
Mineral., 43, 181-207, 1958) matches exactly the description given by Schaller. X-ray powder diffraction patterns of this material can be completely interpreted in terms of a mixture of hureaulite and jahnite. The chemical analysis by Schaller is also nicely interpreted in terms of 53.2% manganian jahnite, 45.4% hureaulite, and 1.4% insoluble. A.P.

Clay Minerals Society Meeting

The sixteenth meeting of the Clay Minerals Society and the 28th Annual Minerals Conference will be held on August 26-29, 1979, at Macon, Georgia. Three days of technical sessions including a symposium on kaolinite processing are currently planned. A two-day field trip is planned with visits to the kaolin mines and processing plants of middle Georgia on Thursday, August 29, and the attapulgite - Andersonville area on Friday, August 30. Explanatory titles of papers are due by May 1, 1979, and the deadline for abstracts is June 1, 1979. Submit titles to Dr. C. E. Weaver, Technical Program Chairman, School of Geophysical Science, Georgia Institute of Technology, Atlanta, Georgia 30332.

The 1980 Clay Mineral Conference will be held in Waco, Texas, on October 5-8. Dr. J. L. McAtee will be the General Chairman of the 1980 Conference.

MSA Short Course on Marine Minerals

A Short Course on Marine Minerals, sponsored by the Mineralogical Society of America, will be held at La Jolla, California, during November 2-3, 1979. It precedes the annual meetings of the Geological Society of America and associated societies in San Diego during November 5-8, 1979. Lectures, demonstrations, and exhibits are planned on the following marine minerals: phosphorite, barite, evaporites, silica polymorphs, zeolites, clays, placer deposits, iron oxides, manganese oxides, and ferromanganese deposits. The purpose of the Short Course is to provide an overview of the mineralogy, geochemistry, paragenesis, and economic potential of minerals on the seafloor or in the ocean.

Further information and registration forms may be obtained from: Roger G. Burns, 54-816, Dept. of Earth and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139.