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NEW MINERAL NAMES*

PETE J. DUNN, JOEL D. GRICE, MICHAEL FLEISCHER, AND ADOLF PABST

Chromdravite*

E. V. Rumantseva (1983) Chromdravite, a new mineral. Zapiski Vses. Mineralog. Obsh., 112, 222–226 (in Russian).

Analysis by K. K. Gunbar after correction for 6.5% impurity of chromian phengite (analyzed) gave SiO_2 30.75, TiO_2 0.13, Al_2O_3 2.92, Cr_2O_3 31.60, V_2O_3 1.46, Fe_2O_3 7.65, MnO 0.19, MgO 9.05, CaO 0.16, Na_2O 2.66, B_2O_3 9.00, loss on ignition 4.43, sum 100.00%. Microprobe analysis gave SiO_2 37.9, Al_2O_3 5.1, Cr_2O_3 30.1, V_2O_3 0.5, Fe_2O_3 8.8, MnO 0.7, MgO 6.5%. The corrected chemical analysis gives the formula $(Na_{0.97}Ca_{0.03})(Mg_{2.57}Mn_{0.03}V_{0.22}Al_{0.16}Ti_{0.02})_{3.00}(Cr_{4.71}Fe^{+3}_{1.08}Al_{0.21})_{6.00}(B_{2.91}Al_{0.09})_{3.00}Si_{5.81}Al_{0.19})_{6.00}O_{27}(O_{0.23}OH_{3.77})_{4.00}$. This is, therefore, unlike chromian varieties previously described, a new member of the tourmaline group with Mg dominant in the Y position, Cr in the Z position.

Chromdravite is trigonal, $a = 16.11$, $c = 7.27$Å. The strongest X-ray lines (28 given) are 6.57(50)(101), 4.05(50)(220), 3.58(75)(012), 3.04(75)(122), 2.62(100)(051), 2.079(50)(223).

Color dark green, nearly black crystals of pyramidal form. D = 3.40. Optically uniaxial, negative, $\omega = 1.778$, $\varepsilon = 1.772$, absorption $O > E$, pleochroic with O dark green, E yellow-green. The infra-red spectrum is given.

The mineral occurs in micaceous metasomatites in the Onezhkii depression, central Karelia, associated with chromian phengite (Cr_2O_3 17.13%), taeniolite, and vanadian muscovite, quartz, and dolomite.

The name is for the composition. Type material is in the mineralogical museum of the Leningrad Mining Institute. **M.F.**

Kularite (= Monazite)

R. A. Nekrasova and I. Ya. Nekrasov (1983) Kularite, an authigenic variety of monazite. Doklady Adkad. Nauk SSSR, 268, 688–693 (in Russian).

The name kularite (for the Kular ridge, Siberia) is given to the so-called "gray monazite" or "black monazite," which has been described by many investigators. Chemical analyses including the individual lanthanides, are given of 7 samples that contain SiO_2 0.03–0.95, ThO_2 1.12–1.40%, D = 4.0–4.5, slightly electromagnetic. The X-ray pattern is stated to be the pattern "of typical monazite without any adventitious reflections."

Discussion

An entirely unnecessary and useless name. **M.F.**

Lithosite*

A. P. Khomyakov, N. M. Chernitsova, and N. I. Chistyakova (1983) Lithosite, $K_6Al_4Si_8O_{25} \cdot 2H_2O$, a new mineral. Zapiski Vses. Mineralog. Obsh., 112, 218–222 (in Russian).

Microprobe analyses of the mineral gave SiO_2 50.0, 49.6; Al_2O_3 20.7, 20.4; K_2O 28.4, 28.0; H_2O (loss on ignition) 2.34, sum of averages 100.94%, corresponding to $K_{5.84}Al_{3.94}Si_{8.08}O_{25} \cdot 2.53H_2O$. Easily decomposed by cold 10% HCl. The infrared spectrum indicates the presence of molecular water.

X-ray study shows it to be monoclinic, pseudo-orthorhombic, $a = 15.197$, $b = 10.233$, $c = 8.435$Å, $\beta = 90.21°$, Z = 2, D (calc.) = 2.54, (meas.) = 2.51. The strongest X-ray lines (47 given) are 3.46 (84)(212,401); 3.26(84)(122,031); 3.07(100)(312,420); 2.82(73)(330,402); 2.10(83)(004).

The mineral occurs as irregular grains, 1–3 mm in size. It is colorless, water-clear, luster vitreous, fracture conchoidal. Hardness by micro-impression, load 50–70 g 412–824, av. 559 kg/sq.mm, or about 5 ½ Mohs. It is optically biaxial, positive, $\alpha = 1.510$, $\beta = 1.513$, $\gamma = 1.527$, $2V = 47°$, $Z = b$, Y near a, X near c. Under X-rays it acquires a bright rose color, which persists for at least 8 months; it is then pleochroic with X and Y colorless, Z bright rose.

The mineral occurs in the S.E. part of the Khibina alkalic massif, Kola Peninsula, in veins of ultra-agpaitic pegmatite cutting nepheline syenites (rischorrites). It occurs in cavernous parts of drill cores consisting of orthoclase, sodalite, aegirine, pectolite, lamprophyllite, lomonosovite, and shafranovskite.

The name is from the Greek lithos (stone), because it consists of the most abundant components of the Earth's crust. Type material is at the Fersman Museum, Acad. Sci. USSR, Moscow, and the museum of the Geological Institute, Kola Branch, Acad. Sci. USSR, Apatite. **M.F.**

Lun'okite*

A. V. Voloshin, Ya. A. Pakhomovskii, and F. N. Tyusheva (1983) Lun'okite, a new phosphate, the manganese analogue of overite, from granitic pegmatites of the Kola Peninsula. Zapiski Vses. Mineralog. Obsh., 112, 232–237 (in Russian).

Microprobe analysis of the mineral gave P_2O_5 35.42, Al_2O_3 13.42, MnO 18.97, FeO 5.55, MgO 3.59, CaO 3.21, H_2O 19.40, sum 99.56%, corresponding to the formula $(Mn_{0.77}Ca_{0.23})(Mg_{0.35}Fe_{0.31}Mn_{0.30})Al_{1.05}(PO_4)_{1.99}(OH)_{1.10} \cdot 3.78H_2O$, or $(Mn,Ca)(Mg,Fe,Mn)Al(PO_4)_2(OH) \cdot 4H_2O$, the Mn analogue of overite (CaMgAl) and of segelerite ($CaMgFe^{+3}$). The D.T.A. curve shows a sharp endothermic peak at 210°C and a broad one at 340°C, and an exothermic peak at 640°C. Loss in weight 3.2% H_2O at 60–160°C, 4.4% at 160–200°C, 11.8% 200–600°C. The infra-red spectrum is given.

The X-ray pattern is similar to those of overite and segelerite and is indexed in space group *Pbca* with unit cell $a = 14.95$, $b =$

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

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18.71, c = 6.96Å., Z = 8, D (calc.) = 2.69, (meas.) = 2.66. The strongest X-ray lines (47 given, many broad or diffuse) are 9.39(9)(020), 3.48(6)(420,002), 2.92(7)(440,431), 2.809(10b) (232,042,161).

Colorless to white with a faint yellowish tint. Hardness 3–4. Optically biaxial, positive, $2V = 70°$, $\alpha = 1.603$, $\beta = 1.608$, $\gamma = 1.616$, $r < v$, distinct, $X = c$, $Z = b$, cleavages: (010) perfect, (001) imperfect.

The mineral occurs as radiating aggregates, 0.5–1.0 mm, in fractures in granitic pegmatites and on crusts of nodules of mitridatite in fractures. Associated minerals are eosphorite, laueite, and kingsmountite.

The name is for the Lun'ok River. Type material is at the Fersman Mineralogical Museum, Moscow, and at the Geological Institute of the Kola Branch, Acad. Sci. USSR, Apatite. **M.F.**

Nd-churchite = neodymian churchite

E. K. Podporina, V. V. Burkov, and K. N. Danilova (1983) Nd-churchites from the crust of weathering of Kazakjstan metamorphic rocks. Doklady Akad. Nauk S.S.S.R., 268, 195–198. (in Russian).

A chemical analysis and X-ray powder data (both normal) are given. X-ray spectrographic analysis shows yttrium to be predominant as usual (Y/(Y+Ln) = 61.6%). Nd is the most abundant lanthanide (15 at.% of the lanthanides, excluding Y). The "new variety" is called Nd-churchite.

Discussion

A useless name for the variety neodymian churchite. It is also sure to cause confusion. the I. M. A. Commission uses names such as Monazite-(Nd) to denote mineral species with Nd predominant. This variety is not even a new one; Semenov and Khomyakov (Diagn. Svoistva Mineral, 1981, p. 88–93) published an analysis of churchite with Nd = 19.3 at.% of the lanthanides, excluding Y. **M.F.**

Rayite*

K. Basu, N. S. Bortinikov, A. Moorkherjee, N. N. Mozgova, A. I. Tespin and L. N. Vyalsov (1983) Rare minerals from Rajpura-Dariba, Rajasthan, India, IV: A new Pb–Ag–Tl–Sb sulfosalt, Rayite. Neues Jahr. Mineral. Monat., 296–304.

Microprobe analysis (average of four analyses) yielded: Pb 47.06, Cu 0.03, Ag 4.54, Tl 2.04, Sb 27.42, S 19.59, sum = 100.68. This is interpreted, in part by a structural similarity to semseyite, as: $Pb_{5.3}(Ag,Tl)_{1.8}(Pb_{2.4}Sb_{7.6})_{\Sigma 10}S_{20.9}$, with a suggested substitution of $2Pb \rightleftarrows Ag^+ + Sb^{3+}$ for compensation in charge balance. This leads to an idealized formula $Pb_5(Ag,Tl)_2(Pb_{2.5}Sb_{7.5})S_{21}$, or alternatively, $Pb_8(Ag,Tl)_2Sb_8S_{21}$. X-ray single crystal study was not possible. The strongest lines in the powder pattern are: 3.90(3)(115,311), 3.74(3)(131), 3.37(10)($\bar{4}01$), 3.26(9)($\bar{3}16$), 2.98(5)(317), 2.06(3)($\bar{6}20$). These were indexed by analogy with semseyite and yielded the lattice parameters $a = 13.60(2)$, $b = 11.96(3)$, $c = 24.49(5)$Å, $\beta = 103.94(12)°$.

Rayite forms tabular 30 μm grains and 0.5 mm patches associated with galena, meneghinite, and owyheeite. It is gray in color and streak and has metallic luster. Cleavage was not observed. D (calc.) is 6.13; no observed value was obtainable due to small crystal size. In reflected light, rayite is white with greenish and blueish tints; bireflectance is weak; pleochroism is greenish to greenish-blue; anisotropism is perceptible; internal reflections absent. Reflectances are (λ,%):480,37.6–40.4; 540,37.5–39.6; 580, 37.2–38.9; 640,36.3–37.5.

Rayite is found at Rajpura-Dariba, Rajasthan, India. The name is for the late Professor Santosh K. Ray of President College in Calcutta. Type material is at the Indian Institute of Technology, Kharagpur, India, and at the I.G.E.M. of the USSR Academy of Sciences, Moscow. **P.J.D.**

Richelsdorfite*

P. Susse and G. Schnorrer-Köhler (1983) Richelsdorfite, $Ca_2Cu_5Sb[Cl/(OH)_6/(AsO_4)_4] \cdot 6H_2O$, a new mineral. Neues Jahr. Mineral. Monat., 145–150.

Richelsdorfite is monoclinic, space group $C2/m$, with $a = 14.17(6)$, $b = 14.42(3)$, $c = 13.57(5)$Å and $\beta = 102.0(2)°$; Z = 4, D (obs.) = 3.20, D (calc.) = 3.27 g/cm^3. The principal lines of the powder pattern are: 13.290(10)(001); 6.612(3)(002); 4.408(5)(003); 3.024(8)(241,$\bar{4}03$); 2.644(2)(422,005). The turquoise to sky-blue tiny tabular crystals are biaxial negative with $2V$ (obs) = 69°. Indices of refraction, calculated from reflectivities on (001) and (010) surfaces, are: $\alpha = 1.698(3)$, $\beta = 1.765(3)$, $\gamma = 1.799(4)$. Optical orientation and pleochroism are: X inclined to c pale blue, Y nearly parallel to a greenish-blue, Z parallel to b light greenish blue, dispersion $r > v$. The luster is vitreous, {001} cleavage is perfect, hardness (Mohs) is 2. The mineral is readily soluble in dilute HCl. Microprobe analysis gave: CaO 8.97, CuO 28.71, ZnO 0.23, FeO 0.01, Sb_2O_5 11.88, As_2O_5 31.18, Cl 1.83, H_2O (by difference) 17.19, total 100.00%. The formula was confirmed by structure determination (Tillmann and Süsse, 1982).

Richelsdorfite was first found in Permian sandstone in the Richelsdorf Mountains, Hesse, with calcite, duftite, tirolite and tetrahedrite, later also in cavities in barite and as an incrustation on blocks of Kupferschiefer. Subsequently it was also recognized in cavities in quartz with calcite, tetrahedrite, galena, brochantite and devilline at St. Andreasberg in the Harz. Richelsdorfite is mostly in very small speheroidal aggregates up to 0.2 mm in diameter. Rarely, tabular single crystals may attain dimensions up to 0.5 mm. Type material is at the University of Goettingen, Germany. **A.P.**

Simonite*

P. Engel and W. Nowacki (1982) The crystal structure of simonite, $T1HgAs_3S_6$. Zeit. Krist., 161, 159–166.

Microprobe analysis of a red mineral occurring within rebullite (Am. Mineral., 68, 644) yielded Tl 24.00, Hg 23.80, Sb 1.68, As 25.55, S 24.97, sum = 100%. Single-crystal and structure study found simonite to be monoclinic, space group $P2_1/n$, with $a = 5.948(2)$, $b = 11.404(6)$, $c = 15.979(5)$Å, $\beta = 90.15(1)°$, Z = 4 for $TlHgAs_3S_6$, and D(calc.) = 5.036. The R value was 0.05 for 2462 observed reflections and 0.07 for all reflections.

Discussion.

A full description, with physical, optical, X-ray powder data, and paragenetical information, is needed. **P.J.D.**

Srilankite*

A. Willgallis, E. Siegmann, and T. Hettiaratchi (1983) Srilankite, a new Zr–Ti-oxide mineral. Neues. Jahr. Mineral. Monat., 151–157.

Microprobe analysis yielded $ZrO_2 + HfO_2$ 43.97, TiO_2 56.30, sum = 100.27 percent, corresponding to $(Zr,Ti)O_2$ with Zr:Ti=1:2. UO_2 is 0.1–0.2 wt.% in the crystals studied. An alternative formula is $ZrTi_2O_6$.

X-ray powder data are indexed on an orthorhombic unit cell with $a = 4.708$, $b = 5.553$, and $c = 5.019$Å, (all ±0.005Å), Z = 4. Extinctions are said to be consistent with space group *Pbcn*. These data are said to be supported by a single crystal study in preparation. The strongest lines in the X-ray powder diffraction pattern are: 3.61(25)(110), 2.92(100)(111), 1.721(30)(130), 1.692(25)(221), 1.516(35)(113).

Srilankite is black with submetallic to adamantine luster, hardness (Vickers) 900–1000; (Mohs) ~ 6½. It has conchoidal fracture and is brittle; an unindexed cleavage is distinct at high magnifications. Optically, srilankite is biaxial, $2V = 16(1)°$; translucent with blue color and high birefringence. Reflectances (nm,%) are: 480,19.4–18.6; 546,18.4–16.0; 589,18.5–16.4; 649,18.7–17.0.

Srilankite occurs in pebbles from a gemstone mine in Rakwana, Sabaragamuva, Sri Lanka. The pebbles are mainly zirconolite and baddeleyite with minor amounts of geikielite, spinel, and perovskite. Srilankite occurs as <1 mm inclusions in such pebbles.

The name is for the country of origin, Sri Lanka. **P.J.D.**

Terskite*

A. P. Khomyakov, E. I. Semenov, A. A. Voronkov, and G. N. Nechelyustov (1983) Terskite, $Na_4ZrSi_6O_{16} \cdot 2H_2O$, a new mineral. Zapiski Vses. Mineralog. Obsh. 112, 226–232 (in Russian).

Electron probe analyses of three grains and their average gave SiO_2 56.1–56.4, 56.3; ZrO_2 17.6–18.0, 17.8; MnO 0.4–0.5, 0.4; Na_2O 18.8–19.4, 19.0, loss when heated to 900°C (H_2O) 6.37, sum (av.) 99.87%, corresponding to the formula $(Na_{3.97}Mn_{0.04})Zr_{0.94}Si_{6.06}O_{16.02} \cdot 2.29H_2O$. The DTA curve shows 2 distinct endothermic effects at 130°C and 410°C, and a weak endothermic effect at 830°C (fusion?). Insoluble in 10% HCl or HNO_3 solution. X-ray study showed terskite to be orthorhombic, pseudotetragonal, $a = 14.12\pm0.06$, $b = 14.69\pm0.06$, $c = 7.51\pm0.03$Å., Z = 4, D (meas.) 2.71, (calc.) 2.74. The strongest X-ray lines (46 given) are 7.11(40)(200), 6.67(35)(011,101); 4.88(35)(121,030,211); 4.09(60)(031); 3.53(35)(400,112); 3.506(50)(321).

The mineral has a pale lilac color, nearly colorless in section. Luster vitreous. Hardness by micro-impression at 40 g load 426–519, av. 478, about 5 on the Mohs scale. Optically biaxial, negative, $\alpha = 1.576$, $\beta = 1.582$, $\gamma = 1.584$ (all ±0.002), $2V = -53°$, dispersion weak $r > v$. In ultra-violet light shows bright green photoluminescence. The infra-red spectrum is given.

The mineral occurs as plates 1–3.5 mm in veins in pegmatites of syenites of Mt. Alluaiv, Lovozero massif, Kola Peninsula; associated with K-feldspar, sodalite, davyne, arfvedsonite, aegirine, and many zirconium silicates, such as eudialyte.

The mineral occurs in alkalic pegmatites on Mt. Aluaiv and Mt. Karnasurt, Lovozero alkalic massif, Kola Peninsula, associated with K-feldspar, hackmanite, natrodavyne, arfvedsonite, and aegirine. Similar fine-grained material had been partially described some years ago from Ilimaussaq, Greenland and the Kola Peninsula.

The name is for the Tersk shore, southeastern Kola Peninsula. Type material is at the Fersman Museum, Acad. Sci. USSR, Moscow, and the museum of the Geological Institute, Kola Branch, Acad. Sci. USSR, Apatite. **M.F.**

Triangulite*

M. Deliens and P. Piret (1982). Uranium-aluminum phosphates from Kobokobo. VI. Triangulite, $Al_3(UO_2 \cdot PO_4)_4(OH)_5 \cdot 5H_2O$, a new mineral. Bull. Minéral, 105, 611–614 (in French).

Electron microprobe analysis gave UO_3 67.10, Al_2O_3 8.90, P_2O_5 16.24 and H_2O (by difference) 7.76 corresponding to $Al_{3.01}[(UO_2)_{4.05}(PO_4)_{3.94}]O_{2.64} \cdot 7.42H_2O$ (based on O = 26.5 for the anhydrated part of the formula) or $Al_3(UO_2 \cdot PO_4)_4(OH)_5 \cdot 5H_2O$.

Single crystal X-ray data shows the mineral is triclinic, space group *P*1 or $P\bar{1}$, with $a = 10.39$, $b = 10.56$, $c = 10.60$Å, $\alpha = 116.4$, $\beta = 107.8$, $\gamma = 113.4°$, Z = 1, D (calc.) 3.68, (meas.) 3.7. The X-ray powder pattern is similar to mundite and ranunculite. The strongest X-ray lines (25 given) are 7.80(100)(100), 4.70(30)($\bar{1}02$), 3.87(80)(200), 3.74(20)($12\bar{2},21\bar{2}$), 3.63(20)($\bar{2}21,\bar{2}12$), 3.39(20)($1\bar{3}2$), 3.15(70)($\bar{2}30,\bar{2}03$), 2.99(50)($0\bar{3}3$), 2.86(20)($1\bar{3}3$), 2.574(20)(300).

The mineral occurs as bright yellow, aggregates of flat, triangular or rhombohedral crystals with a maximum length of 0.2 mm. Optically biaxial positive; *ns* $\alpha = 1.639$(calc.), $\beta = 1.665$, $\gamma = 1.704$, $2V = 80°$; optical orientation $Z \sim [0\bar{1}1]$, $Y \sim [011]$ and $X \perp [100]$; pleochroic with *Y* pale green-yellow, *Z* bright yellow. Most crystals have a 180° rotational twin about $[01\bar{1}]$ and [011]. It is not fluorescent under UV radiation.

The mineral occurs within a quartz–K-feldspar-columbite zone of a complex pegmatite. Associated minerals include beryl, metamict zircon and minor amounts of meta-autunite, phosphuranylite and ranunculite. The name is in reference to the triangular habit of the crystals and the mineral belongs to the ranunculite group. Type material is preserved in the Royal Museum of Central Africa in Tervuren. **J.D.G.**

Ushkovite*

B. V. Chesnokov, V. A. Vilisov, G. E. Cherepivskaya, and M. G. Gorskaya (1983) Ushkovite, $MgFe_2^{3+}(PO_4)_2(OH)_2 \cdot 8H_2O$, a new mineral. Zapiski Vses. Mineralog. Obsh., 112, 42–46 (in Russian).

Analysis by G. E. Ch. on 100 mg gave MgO 8.79, MnO 1.88, CaO 2.54, FeO none, Fe_2O_3 29.87, Al_2O_3 none, P_2O_5 30.47, H_2O^- 12.28, H_2O^+ 14.83, sum 100.66%. The sample contained up to 4% Mn hydroxides and small inclusions of francolite. Corrected for these, the analysis corresponded to $(Mg_{0.96}Mn_{0.04})Fe_2^{3+}(PO_4)_2(OH)_2 \cdot 7H_2O$. The DTA curve showed two endothermic effects at 185 and 250°C and loss of water up to 280° of 27.4%, up to 1000°, 33.2%, corresponding to the formula with $8H_2O$, which is accepted. The mineral fuses at 980°C.

X-ray study shows the mineral to be triclinic, $a = 5.20$, $b = 10.70$, $c = 7.14$Å., $\alpha = 108°36'$, $\beta = 106°56'$, $\gamma = 72°43'$, space group probably $P\bar{1}$. It is isostructural with laueite ($MnFe_2^{3+}$), gordonite ($MgAl_2$), paravauxite ($FeAl_2$), and sigloite (Fe^{3+}, Fe^{2+})Al_2. The strongest X-ray lines (16 given) are 9.86(100)(010), 6.57(80)(001), 4.95(50)(020,011), 4.85(50)(100), 3.28(60)(11$\bar{2}$), 3.20(80)(12$\bar{2}$).

The mineral occurs as crystals (up to 2mm), short prismatic, principal faces c (001), b (010), M (1$\bar{1}$0), minor faces a (100), m (110). Pale yellow to orange-yellow and light brown. Luster vitreous to pearly on the perfect cleavage (010), and greasy on fracture. D 2.38, H 3.5, brittle. Dissolved by dilute acids. Optically biaxial, negative, $\alpha = 1.584$, $\beta = 1.637$, $\gamma = 1.670$ (all ± 0.002), $2V - 50°$, $r > v$ strong, $Y \angle c = 26°$. The infra-red spectrum is given.

The mineral is a supergene product of weathering of triplite in granite pegmatite, Il'men Mts., Urals, associated with hydrous Mn oxides, francolite, mitridatite, and beraunite.

The name is for naturalist, S. I. Ushkov (1880–1951), who studied the Il'men National Forest. Type material is in the Fersman Museum, Acad. Sci. USSR, Moscow, the Leningrad Mining Museum, and the museum of the Il'men National Forest. **M.F.**

Unnamed aluminum silicates

R. L. Stanton (1983) The direct derivation of sillimanite from a kaolinitic precursor: evidence from the Geco Mine, Manitouwadge, Ontario. Econ. Geol., 78, 422–437.

Three unknown aluminum silicates occur in quartz–muscovite–biotite–garnet–staurolite–sillimanite gneisses from the Geco Mine, Manitouwadge, Ontario. These are (1) colorless to pale brown, finely granular material in biotite, (2) dark, black to brown clots in quartz, and (3) brown to light brown felted patches. Selected microprobe analyses, with H_2O by difference, yielded for mineral (1) SiO_2 43.62, Al_2O_3 37.57, TiO_2 0.04, Fe_2O_3 2.76, MgO 0.62, CaO 0.17, Na_2O 0.12, K_2O 0.04 H_2O 15.26, sum = 100.00%, corresponding to $Al_2O_3 \cdot 2SiO_2 \cdot 4H_2O$, close to kaolinite with additional interlayer water. (four analyses given).

Mineral (2) yielded SiO_2 41.48, Al_2O_3 47.72, TiO_2 0.06, Fe_2O_3 1.19, MgO 0.44, CaO 1.14, MnO 0.03, Na_2O 0.67, K_2O 0.33, H_2O 6.94, sum = 100% (one of 5 analyses given). There is much variation in the analyses which are clustered into three groups: $2Al_2O_3 \cdot 3SiO_2 \cdot xH_2O$, $3Al_2O_3 \cdot 4SiO_2 \cdot xH_2O$, and $4Al_2O_3 \cdot 5SiO_2 \cdot xH_2O$, with $x < 1.5$.

Mineral (3) yielded SiO_2 41.25, Al_2O_3 51.39, TiO_2 0.02, Fe_2O_3 2.14, MgO 0.72, CaO 0.13, MnO 0.04, Na_2O 0.17, K_2O 0.71, H_2O 3.43, sum = 100.00% (one of 4 analyses given, all of which vary). These analyses correspond to compositions $3Al_2O_3 \cdot 4SiO_2 \cdot H_2O$, $4Al_2O_3 \cdot 5SiO_2 \cdot 2H_2O$, $5Al_2O_3 \cdot 6SiO_2 \cdot H_2O$, and $Al_2O_3SiO_2$ (sillimanite). The foregoing analyses represent only a portion of the compositional variation in these materials. Only mineral (1) is reasonably consistent in composition.

These phases are interpreted to suggest that metamorphic sillmanite may form through stages from a kaolinitic precursor. **P.J.D.**

Unnamed As_2S_3

W. Tufar (1982) A new type of sulphosalt mineralization in the Myrthengraben Gypsum deposit, Semmering, Lower Austria. Ore Genesis, the state of the Art. Springer Verlag, New York, 131–140.

This unknown phase forms very fine-grained myrmekitic intergrowths with tennantite in the deposit noted in the title. Preliminary microprobe analysis suggests it is As_2S_3, with very minor Sb substitution. It is characterized by a blue-gray reflectance color, moderate reflectivity, strong birefringence, strong anisotropism and internal reflections. Reflectivity at 548 nm is in air (Rp 18.6, Rg 28.2), in oil (Rp 7.0, Rg 12.8). **P.J.D.**

Unnamed $(Co,Ni,Fe,Cu)_2AsS_2$

F. M. Vokes and G. S. Strand (1982) Ore Genesis, the state of the art. Springer Verlag, New York, 118–130.

Microprobe analyses yielded (range of 4): Co 26.78–29.57, Ni 9.86–11.06, Fe 4.36–4.99, Cu 0.79–1.24, As 28.99–32.78, S 22.14–26.87, sums 99.76–100.70%. These are interpreted to be ideally $(Co,Ni,Fe,Cu)_2AsS_2$. X-ray study was unsuccessful due to paucity of material.

This phase occurs associated with cobaltite/gersdorffite which is partially replaced by bornite and digenite, from the Raipas, Mine, Finnmark, Norway. The unknown phase forms part of the rims of 30 μm spherules. Extensive textural discussion is presented. **P.J.D.**

Unnamed Fe–Mn-phosphate

O. V. Knorring and Th. G. Sahama (1982) Some Fe–Mn phosphates from the Buranga pegmatite, Rwanda. Schweiz. Mineral. Petr. Mitt., 62, 343–352.

Microprobe analysis of a brown to yellow brown radial, fibrous unknown phosphate yielded FeO 31.5, MnO 21.9, P_2O_5 30.8. The strongest lines in the X-ray powder diffraction pattern are 3.464(vs)(020), 3.264(s)(022), 3.218(s)(200). The pattern can be indexed on a monoclinic unit cell with a = 6.44(2), b = 6.93(2), c = 19.43(3), $\beta = 93°15'$, $V = 866Å^3$. The fiber axis is c. Optically, it is biaxial with small $2V$, $\alpha \approx 1.80$, $\gamma \approx 1.85$; $X = c$; absorption $Z > Y \simeq X$. The small size and poor quality of the fibers precluded more precise optical or X-ray measurements. This phase may be similar to one reported by Frondel (Am. Mineral., 34, 513–540) from Waldgirmes, Hessen, Germany. **P.J.D.**

Unnamed monoclinic dimorph of columbite (?)

S. I. Konovalenko, A. V. Voloshin, Ya. A. Pakhomovskii, L. N. Rossovskii, and S. A. Anan'ev (1982) Tungsten-bearing varieties of tantalo-niobates from miarolitic granite pegmatites of southwestern Pamir. Mineralog. Zhurnal 4, no. 1, 65–74 (in Russian).

Microprobe analyses are given of columbite containing 13.86–22.84% WO_3. The analysis with WO_3 22.84% is calculated to the formula $Mn_{1.00}(Mn_{0.34}Fe_{0.10}W_{0.50}Ti_{0.04})(Nb_{1.79}Ta_{0.21})O_8$. X-ray powder data are given and calculated to a unit cell with a = 9.56, b = 11.53, c = 5.01Å, $\beta = 92°00'$.

Discussion

The X-ray powder data correspond reasonably well with lines of columbite + lines of wolframite. **M.F.**

Unnamed $Na_2Ca_2Si_3O_9$ and new data on combeite

R. X. Fischer and E. Tillmanns (1983) The crystal structures of natural $Na_2Ca_2Si_3O_9$ from Mt. Shaheru (Zaire) and from the Mayener Feld (Eifel). Neues Jahr. Mineral. Monat., 49–59. (in German)

New microprobe analysis of combeite (43, 791 (1958), 67, 418 (1982)) from the type locality, Mt. Shaheru (Zaire), leads to the formula $Na_{2.4}Ca_{1.5}Si_3O_9$ with minor amounts of Fe, Zn, Mn and Mg. Microprobe analysis of a newly recognized mineral from the Eifel leads to the formula $Na_{2.2}Ca_{1.9}Si_3O_9$. The two minerals correspond to the high-temperature (above *ca.* 485° C) and low-temperature forms respectively of the synthetic phase $Na_2Ca_2Si_3O_9$ whose composition is known to range from $Na_{1.7}Ca_{2.15}Si_3O_9$ to $Na_{3.2}Ca_{1.4}Si_3O_9$ (Moir and Glasser, 1974). The structure of combeite has been determined in the space group $R\bar{3}m$, a_h = 10.429(2), c_h = 13.149(3)Å, Z = 6, D (calc.) 2.79 and refined to R = 0.06. The structure of the mineral from the Eifel, which remains, unnamed, has been determined in the space group $P3_1$ (or $P3_2$), a 10.464(2), c 13.176(3)Å, Z = 6, D (calc.) = 2.85 and refined to R = 0.07. **A.P.**

Unnamed silicide

Yusupov, R. G.; Dzhenchuraev, D. D.; and Radzhabov, F. F. (1982) Accessory native chromium and a natural compound of the series Fe–Cr–Si in rocks of the Gavasai ore field. Izvest. Akad. Nauk Kirgiz SSR 1982, no. 5, 25–26 (in Russian).

Globular deposits found in mafic or ultramafic rocks are stated to range from 0.05–0.8, av. 0.2 mm, and consist of an outer shell of cohenite, a core of native Cr or ferrochrome, and an intermediate silicide. Microprobe analysis of the silicide gave Fe 21.8, Cr 55.2, Ti 7.1, Ni 0.2, Cu 0.1, Si 15.2, sum 99.6%, corresponding to $(Cr,Fe,Ti)_3Si$.

Discussion

Data inadequate. Material of this size could be examined optically and by X-ray methods. **M.F.**

NEW DATA

Becquerelite

J. Piret-Meunier and P. Piret (1982) New determination of the crystal structure of bequerelite. Bull. Mineral., 105, 606–610 (in French).

Crystal structure study found becquerelite to be orthorhombic, space group $Pn2_1a$, with a = 13.86(2), b = 12.30(1), and c = 14.92(3)Å, Z = 4. The new chemical formula is $Ca[(UO_2)_6O_4(OH)_6] \cdot 8H_2O$. **P.J.D.**

hilgardite, parahilgardite, tyretskite, strontiohilgardite kurgantaite = strontian tyretskite

R. v. Hodenberg and R. Kühn (1981) Comparative consideration of minerals of the hilgardite group. Kali und Steinsalz, 8, 206–217 (in German).

Microprobe analyses for Ca, Sr, and Cl on hilgardite, parahilgardite, and tyretskite from the Choctaw Salt Dome, Louisiana, (type locality of the first two), of tyretskite from the Boulby potash mine, England, and of strontiohilgardite from Reyershausen, Germany, all lead to formulas of the type $(Ca,Sr)_2B_5O_9(Cl,OH) \cdot H_2O$. Cell dimensions, calculated from powder data indexed with the aid of precession patterns, are reported as follows: hilgardite (Choctaw) a = 6.321(2), b = 11.315(3), c = 11.441(4)Å β = 90.00(3)° Cc; parahilgardite (Choctaw) a = 6.313(4), b = 6.481(3), c = 17.51(1), α = 84.10(3), β = 79.61(3), γ = 60.85(3)°, $P1$; Cl-tyretskite (Boulby) a = 6.297(2), b = 6.464(1), c = 6.565(1), α = 74.14(1), β = 61.68(1), γ = 61.26(1), $P1$; strontiohilgardite (Reyershausen) a = 6.393(3), b = 6.482(3), c = 6.612(3), α = 75.59(2), β = 60.97(2), γ = 60.79(2)°, $P1$. The data of Kondrat'eva (1964) for tyretskite which had been described without name by Ivanov and Yarzhemskii (1954) (M.A. 17-500 for both references) are reinterpreted to give dimensions for what is now designated OH-tyretskite, a = 6.30(1), b = 6.47(1), c = 656(1), α = 74.27(5), β = 61.6(1), γ 61.25(5)°, $P1$, very close to those of the Cl-tyretskite from Boulby, which had been reported by Hodenberg and Kühn (1977, Kali und Steinsalz, 4, 165–170). The formula for kurgantaite was initially given as $(Sr,Ca)_2(BO_2)_4 \cdot H_2O$(?) (40, 941, 1955). The chemical data for kurgantaite (Yarzhemskii, 1952) after deduction for admixed celestite yield a formula similar to that of OH-tyretskite but with Sr in excess of Ca. From the X-ray data reported for kurgantaite much later by Kondrat'eva (1964) the revised cell dimensions a = 6.38(1), b = 6.488(8), c = 6.61(7), α = 77.15(5), β = 61.27(5), γ = 60.71(8)° are obtained, close to the dimensions found for OH-tyretskite.

Three distinct structures are recognized among the minerals here considered:- that of hilgardite (monoclinic) determined by Ghose and Wan (64, 187–195, 1979), that of tyretskite (triclinic) determined by Rumanova *et al.* (M.A. 79-2129) who referred to it as "triclinic hilgardite", and the undetermined structure of parahilgardite (triclinic). The mineral described as strontiohilgardite by Braitsch (44, 1102, 1959) is now recognized as having the structure of tyretskite so that its name is inappropriate. A revision of the nomenclature of this group is suggested but no action has been taken to obtain approval by the I.M.A. Commission. **A.P.**

Lermontovite

V.G. Melkov, L. N. Belova, A. I. Gorshkov, O. A. Ivanova, V. A. Sivtsov, and V. A. Boronikhin (1983) New data on lermontovite. Mineralog. Zhurnal. 5, no. 1, 82–87 (in Russian).

Lermontovite was described in 1957 (43, 379, 1958) as a hydrous U^{+4}–U^{+6} phosphate. Type material from a collection has been re-examined. The average of four analyses was UO_2 65.63, Tl_2O 9.46, CaO 0.27, P_2O_5 18.54, H_2O (by difference) 6.10%. Because of the gray-green color of the mineral, U is calculated as U^{+4} and the formula derived is $U^{+4}(PO_4)(OH) \cdot 0.8H_2O$.

The mineral gave sharp electron diffraction patterns but "particles retain their ability to diffract for not more than 30–40 seconds." The strongest lines are 4.87(80), 4.12(80), 3.92(100), 3.83(80), 3.29(95), 3.15(70), 3.11(70), 2.69(70). The mineral is orthorhombic, space group perhaps $Ccca$, a = 9.74, b = 19.0, c = 10.1Å.

The mineral occurs as radiating fibrous aggregates, G 4.50–4.00, extinction parallel, *ns* $\alpha = 1.686–1.690$, $\beta = 1.707$, $\gamma = 1.724–1.726$, $Z = c$ = elongation. **M.F.**

Musgravite*, Taaffeite

(Taprobanite = Taaffeite, Taaffeite-9*R* = Musgravite)

K. Schmetzer (1983) Crystal chemistry of natural Be–Mg–Al-oxides: taaffeite, taprobanite, musgravite, Neues Jahr. Mineral., Abhandl., 146, 15–28 (in English).

The chemistry and crystallography of these three minerals is reviewed. The identity of taprobanite with taaffeite (67, 1067 (1982)) is confirmed; the name taprobanite is dropped and the name taaffeite is retained for the hexagonal mineral, space group $P6_3mc$, $a = 5.69$, $c = 18.3$Å, formula $(Mg,Fe,Zn,Mn)_3Al_8BeO_{16}$, Z = 2.

The mineral described from Australia by Hudson *et al.*, Mineralog. Mag., 36, 305–310 (1967) and from Antarctica by Grew *et al.* (66, 1022–1033, 1981) as taaffeite-9*R*, rhombohedral, $a = 5.675$, $c = 41.096$Å, composition $(Mg,Fe,Zn)_2Al_6BeO_{12}$, Z = 6, the Mg-analogue of pehrmanite (67, 859, 1982), was previously named taaffeite-9*R*. This name for the phase is dropped in favor of musgravite, a name originally approved by the IMA Commission. **M.F.**

Pilsenite redefined

Wehrlite discredited

T. Ozawa and H. Shimazaki (1982) Pilenite redefined and wehrlite discredited. Proc. Japan Acad., 58, 291–294.

Wehrlite

Topotype wehrlite is reexamined and found to be a mixture of Bi_4Te_3 and hessite, Ag_2Te. This explaines the silver content of earlier studies and the variance in previous formulae. The mixture was identified using microprobe and X-ray diffraction methods.

Pilsenite

Pilsenite is redefined as the Bi_4Te_3 component of the above mixture. It is rhombohedral, space group $R\bar{3}m$ with $a = 4.446(2)$ and $c = 41.94(2)$Å, Z = 3. The strongest lines in the X-ray powder diffraction pattern are: 3.25(vs)(322), 2.36(s)(554), 2.22(s)($10\bar{1}$), 1.998(s)(777), 1.833(s)(331), 1.485(s)(876).

Microprobe analysis of pilsenite from Deutsch-Pilsen, Hungary, yielded: Bi 65.2(64.7–66.0), Pb 1.1(0.9–1.3), Ag 0.1(0.0–0.3), Fe 0.0(0.0–tr.), Te 31.0(30.6–31.2), S 0.1(0.1–tr.), corresponding to $(Bi_{3.87}Pb_{0.07}Ag_{0.1})_{\Sigma 3.95}(Te_{3.01}S_{0.04})_{\Sigma 3.05}$, or ideally Bi_4Te_3. Both the discreditation and redefinition were approved by the I.M.A. **P.J.D.**

Steenstrupine

P. B. Moore and J. Shen (1983) Crystal structure of steenstrupine: a rod structure of unusual complexity. Tschermaks Min. Petr. Mitt., 31, 47–67.

Crystal structure determination on a crystal from Tunugdliarfik, South Greenland, was redefined to $R = 0.073$ for 1740 independent reflections. Unit cell parameters are $a = 10.460(4)$, $c = 45.479(15)$Å, space group $R\bar{3}m$, Z = 3. A possible formula is $Na_{14}Ce_6^{3+}(Mn^{2+}Mn^{3+})Fe_2^{3+}(Zr,Th)^{4+}(OH)_2(PO_4)(PO_4)_6(Si_6O_{18})_2 \cdot 3H_2O$. **P.J.D.**

Sturtite = neotocite/hisingerite

R. A. Eggleton, J. H. Pennington, R. S. Freeman and I. M. Threadgold (1983) Structural aspects of the hisingerite-neotocite series. Clay Minerals, 18, 21–31

Examination of topotype sturtites from Broken Hill, New South Wales, Australia, using TEM techniques, chemical analyses, X-ray absorption edge spectroscopy, and Mössbauer spectroscopy indicate that "sturtites" have compositions and characteristics of the $FeSiO_3 \cdot H_2O—MnSiO_3 \cdot H_2O$ series known as hisingerite/neotocite.

Discussion

Formal discreditation requires approval by the I.M.A. Commission on New Minerals and Mineral Names; such approval is not indicated in this paper. For further reference to hisingerite/neotocite, see Clark *et al.*, 1978 (Mineral. Mag., 42, 279–280 & M26–M30), Fleischer (AM 65, 210), and Brigatti (Developments in Sedimentology, 35, 97–110).

Tancoite

F. C. Hawthorne (1983) The crystal structure of tancoite. Tschermaks Min. Petr. Mitt., 31, 121–135.

Crystal structure analysis of tancoite confirms the formula $LiNa_2H[Al(PO_4)_2(OH)]$ and provides new unit cell parameters $a = 6.948(2)$, $b = 14.089(4)$, $c = 14.065(3)$Å, $V = 1376.8$Å^3, space group *Pbcb*, Z = 8. The structure was refined to an R value of 6.1% for 1086 observed reflections. **P.J.D.**