

## NEW MINERAL NAMES

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## Chaoite

AHMED EL GORESY (1969) Eine neue Kohlnestoff—Modifikation aus dem Nördlinger Ries. *Naturwissenschaften*, **56**, 493–494.

The previously described polymorph of carbon [*Amer. Mineral.* **54**, 326 (1969)] is named chaoite for E. C. T. Chao, petrologist, U. S. Geological Survey, for his work on the mineralogy and shock phenomena of the Ries Crater. No new data are given. Chaoite has also been reported (by X-ray data) from the Goalpara and Dyalpur carbonaceous chondrites by Vdovykin [*Geokhimiya*, **1969**, 1145–1148. (1969)].

## Unnamed Palladium Minerals; Norilskite = Mixture

A. D. GENKIN (1968) Minerals of the platinum metals and their associations in the copper-nickel ores of the Noril'sk deposits. Izdat. "Nauka," 1–105; [abstr. *Zap. Vses. Mineral. Obshch.*, **98**, 321, 333 (1969)].

(Pd, Pb)<sub>3</sub>As forms microscopic rims around crystals of sperrylite. Analysis gave Pd 66.2, Pb 17.5, As 15.5, sum 99.2%; Pd:Pb:As = 3.0:0.4:1. In reflected light brownish rose, slightly anisotropic. Reflectivity (nm and %): 460, 44.0%; 500, 46.0; 540, 47.0; 580, 48.5; 620, 51.0; 660, 52.5; 700, 53.0; 740, 54.8.

Tests of the mineral previously considered to be Pd<sub>4</sub>Pb [*Amer. Mineral.* **46**, 464 (1961)] showed that it contained As in amounts less than present in (Pd,Pb)<sub>3</sub>As.

(Pd,Ni)<sub>3</sub>As occurs as small grains filling interstices between grains of sperrylite and pentlandite. Analysis gave Pd 70.0, Rh 3.0, Ni 6.0, Cu 2.0, As 20.0, sum 101.0%; the ratios Pd:Ni:Rh:Cu:As = 2.5:0.4:0.1:0.1:1. In reflected light, color is light creamy-white with a trace of rose tint, as compared to pentlandite. Distinctly anisotropic, with gray-blue to brown color effects.

Reflectivity (nm, %): 460, 45.0; 500, 47.8; 540, 49.0; 580, 50.8; 620, 53.5; 660, 55.0; 700, 55.0; 740, 54.5%. (Compare Pd<sub>3</sub>Ni<sub>3</sub>As<sub>3</sub>, *Amer. Mineral.* **53**, 1063).

Norilskite [*Amer. Mineral.* **25**, 710 (1940)] is found to consist of intergrowths of several platinum minerals.

## Unnamed Telluride; Unnamed Sulfosalt

W. C. KELLY, AND E. N. GODDARD (1969) Telluride ores of Boulder County, Colorado. *Geol. Soc. Amer. Mem.* **109**, 1–237 (esp. p. 107–109).

An unidentified mineral from the Gray Eagle mine, Boulder County, is gray with a tan tint, tarnishing blue-gray, streak black. It contains major Ag, Te, with variable traces of Cu; close in composition to hessite. The strongest X-ray lines are 2.60 (m), 2.21 (vs), 2.15 (m), 2.10 (s). Reflectivity 20.5–24.0, av. 22.8%. Bireflectance nil, no internal reflections. No cleavage, no twinning, fracture irregular to subconchoidal. Vickers hardness: 30 g load 39.6–86.2, av. 56.4; 100 g load, 90.8–100.6, av. 100.3. Polishes well, Talmage hardness *A*. Etched by FeCl<sub>3</sub> and HgCl<sub>2</sub>, turning iridescent to black; negative in 60 seconds with HNO<sub>3</sub>, HCl, KOH, KCN.

The mineral occurs in dense anhedral veinlets and vug fillings in vein quartz. It is molded against pyrite and is veined by chalcopyrite and Au.

An unknown sulfosalt has been found from the Croesus, King Wilhelm, and Little Johnny mines. Electron probe analyses show Pb, Ag, Sb, and S. X-ray patterns are poor

but all show strong lines at 3.50, 3.35, 2.88, 1.98 Å., close to fizelyite. Moderately birefractant (yellow-white to violet-white), strongly anisotropic with blue-gray to yellow-white polarization colors, occasional red internal reflections. It occurs as irregular to fibrous clots up to 0.12 mm. in diameter in telluride ores and as fibrous vug linings with petzite, and nagyagite.

### Plumbopyrochlore

N. V. SKOROBOGATOVA, G. A. SIDORENKO, K. A. DOROFEEVA AND T. I. STOLYAROVA (1966) Plumbopyrochlore. *Geol. Mestorozhd. Redk. Elem.* **30**, 84-95 [in Russian].

Analyses of red plumbopyrochlore (T.I.S.) and of greenish-yellow yttrian plumbopyrochlore (K.A.D.) gave PbO 38.68, 27.50; RE<sub>2</sub>O<sub>3</sub> 4.87, 11.80; UO<sub>3</sub> 1.82, 3.82; CaO 1.17, 1.71; Na<sub>2</sub>O—, 0.20; ThO<sub>2</sub>—, 1.19; K<sub>2</sub>O—, 0.13; SrO—, 0.19; MnO—, 0.14; MgO—, 0.05; Sb<sub>2</sub>O<sub>3</sub>—, 0.19; Bi<sub>2</sub>O<sub>3</sub>—, 0.32; Nb<sub>2</sub>O<sub>5</sub> 40.68; 35.00; Ta<sub>2</sub>O<sub>5</sub> 3.58, 4.16; TiO<sub>2</sub> 0.81, 0.68; Fe<sub>2</sub>O<sub>3</sub> 2.87, 1.10; Al<sub>2</sub>O<sub>3</sub> 0.64, 1.28; SnO<sub>2</sub> 0.61, 2.02; SiO<sub>2</sub> 2.82, 2.91; P<sub>2</sub>O<sub>5</sub>—, 0.21; H<sub>2</sub>O—, 0.32; H<sub>2</sub>O<sup>+</sup>—, 4.28; H<sub>2</sub>O ± 1.00, —; F—, 0.16; sum 99.55, 99.36%. The rare earths are predominantly Y, with minor Yb, Er, Dy; calcd. mol. weights 280.2, 290.7. Formulas calculated [ideally A<sub>2</sub>B<sub>2</sub>(O, OH)] on the basis of B = 2 are, resp.: (Pb<sub>0.80</sub>Y<sub>0.24</sub>U<sub>0.10</sub>Ca<sub>0.09</sub>)(Nb<sub>1.42</sub>Ta<sub>0.07</sub>Fe<sub>0.17</sub>Al<sub>0.05</sub>Sn<sub>0.02</sub>Si<sub>0.22</sub>)O<sub>6.18</sub>.0.52H<sub>2</sub>O, or A<sub>1.23</sub>B<sub>2</sub>O<sub>6</sub>.2.0.5H<sub>2</sub>O; (Pb<sub>0.62</sub>Y<sub>0.42</sub>Ca<sub>0.15</sub>U<sub>0.06</sub>Na<sub>0.03</sub>)(Nb<sub>1.32</sub>Ta<sub>0.08</sub>Ti<sub>0.05</sub>Fe<sub>0.07</sub>Al<sub>0.13</sub>Si<sub>0.21</sub>P<sub>0.01</sub>)O<sub>6.27</sub>F<sub>0.02</sub>.2.45H<sub>2</sub>O, or A<sub>1.23</sub>B<sub>2</sub>O<sub>6</sub>.3.2.5H<sub>2</sub>O.

The second sample is therefore intermediate between plumbopyrochlore and obruchevite.

X-ray study showed that both were crystalline and cubic, with  $a$  10.534 ± 0.05 and 10.57 ± 0.01 Å. The strongest lines of plumbopyrochlore are 3.02 (10)(222), 2.615 (6)(400), 1.861 (9)(440), 1.581 (9)(622), 1.209 (7)(662), 1.180 (6)(840), 1.077 (8)(844), 1.017 (8)(666, 10.2.0). When the mineral is heated to 1200°,  $a$  decreases to 10.52 Å. and a fergusonite phase appears.

The mineral occurs as grains and zoned octahedral crystals, dark brown at the center, greenish-yellow to red on the periphery. G. plumbopyrochlore not detd., yttrian variety 5.04. Isotropic,  $n$  2.08 ± 0.015 (plumbopyrochlore); 2.025 (yttrian variety).

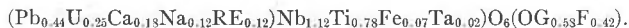
The minerals occur in metasomatically altered granitic rocks, Urals, associated with quartz, microcline, albite, and aegirine. Compare plumbomicrolite, *Am. Mineral.* **47**, 1220-1221 (1963).

The mineral was approved in 1968 by the Commission on New Minerals and Mineral Names, IMA, by a vote of 5-3 with 5 abstentions.

### Plumbobetafite

A. A. GANZEEV, A. F. EFIMOV, AND G. V. LYUBOMILOVA (1969) Plumbobetafite, a new mineral variety of the pyrochlore group: *Tr. Mineralog. Mus. Akad. Nauk SSSR* **19**, 135-137 [in Russian].

Analysis by G. V. L. gave Nb<sub>2</sub>O<sub>5</sub> 30.96, Ta<sub>2</sub>O<sub>5</sub> 1.65, TiO<sub>2</sub> 13.30, Fe<sub>2</sub>O<sub>3</sub> 1.14, PbO 20.70, ThO<sub>2</sub> 0.15, UO<sub>2</sub> 1.70, UO<sub>3</sub> 13.73, RE<sub>2</sub>O<sub>3</sub> 4.63, CaO 2.11, MnO 0.34, Na<sub>2</sub>O 0.83, K<sub>2</sub>O 0.14, B<sub>2</sub>O<sub>3</sub> 0.23, SO<sub>3</sub> 0.55, SiO<sub>2</sub> 2.15, H<sub>2</sub>O+ 2.62, loss on ignition 1.75, F 1.51, sum 100.18 (given as 100.34) —(O=F<sub>2</sub>) 0.63=99.55% (given as 99.71%). Excluding SiO<sub>2</sub>, this gives the formula



Spectrographic analysis showed also Sb, Bi, Sr, and Zr 0.0X-O.X%. The rare earths consist of La 20.6, Ce 61.0, Pr 4.4, Nd 10.5, Sm 1.0, Gd 0.5, Dy 0.5, Y 1.5%. A DTA curve showed an endothermic break at 300°, two exothermic breaks at 625° and 710°.

The mineral is metamict; after being heated to 800°, the x-ray pattern corresponds to a cubic phase with  $a$  10.33 ± 0.01 Å. The mineral forms rounded isometric grains up to 2–3 mm., rarely octahedral crystals with curved faces. Color yellowish, sometimes with brownish-black cores. Luster adamantine. Fracture irregular.  $\rho$  4.64.

The mineral occurs as an accessory in a microcline-quartz-albite-aegirine-riebeckite dike cutting nepheline syenite of the Burpala alkalic massif, northern Baikal.

NOTE.—The nomenclature of this mineral, plumbopyrochlore, and plumbomicrolite will be discussed by the IMA Committee on the Pyrochlore group.

#### Hydrocalcite (= Monohydrocalcite)

HANNELORE MARSCHNER (1969) Hydrocalcite ( $\text{CaCO}_3 \cdot \text{H}_2\text{O}$ ) and nesquehonite ( $\text{MgCO}_3 \cdot 3\text{H}_2\text{O}$ ) in carbonate scales. *Science* 165, 1119–1121.

The name hydrocalcite is proposed for  $\text{CaCO}_3 \cdot \text{H}_2\text{O}$  (hexagonal,  $a$  6.092,  $c$  7.534 Å.), found as a constituent of carbonate scale deposited in air scrubbers of air-conditioning plants and at the mouths of cold water pipes. X-ray powder data are given.

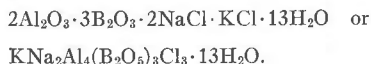
DISCUSSION.—Unnecessary name for monohydrocalcite [*Amer. Mineral.* 49, 1151 (1964)]. The name is doubly unacceptable because it was used in 1892 for  $\text{CaCO}_3 \cdot 3\text{H}_2\text{O}$  (?), see *Dana's System 7th Ed.*, v. 2, p. 227.

#### Satimolite

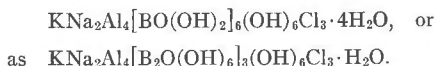
V. M. BOCHAROV, I. I. KHALTURINA, N. P. AVROVA, AND YU. V. SHIPOVALOV (1969) The new mineral satimolite, a hydrous chlorine-containing borate of aluminum and alkalis. *Tr. Mineral. Muz. Akad. Nauk SSSR*, 19, 121–125 [In Russian].

I. V. OSTRAVSKAYA, The formula for the new borate satimolite. *Tr. Mineral. Muz. Akad. Nauk SSSR* 19, 202–205 (1969) [in Russian].

Microchemical analysis was made by I. N. Kuznetsova on 100. mg. of material which contained boracite. It gave  $\text{B}_2\text{O}_3$  35.80,  $\text{Al}_2\text{O}_3$  16.62,  $\text{Fe}_2\text{O}_3$  1.78,  $\text{MgO}$  8.39,  $\text{CaO}$  none,  $\text{Na}_2\text{O}$  4.97,  $\text{K}_2\text{O}$  4.18,  $\text{H}_2\text{O}^+$  19.33,  $\text{H}_2\text{O}^-$  none,  $\text{Cl}$  11.48, sum 102.55 — ( $0 = \text{Cl}_2$ ) 2.59 = 99.96% Deducting  $\text{MgO}$  and  $\text{Fe}_2\text{O}_3$  as boracite and deducting corresponding amounts of  $\text{B}_2\text{O}_3$  and  $\text{Cl}$  and recalculating to 100%, this gave  $\text{B}_2\text{O}_3$  24.76,  $\text{Al}_2\text{O}_3$  24.10,  $\text{Na}_2\text{O}$  7.21,  $\text{K}_2\text{O}$  6.06,  $\text{H}_2\text{O}$  28.03,  $\text{Cl}$  12.70, giving the formula-



A second sample with less boracite gave on microchemical analysis of 10 mg  $\text{Na}_2\text{O}$  6.24,  $\text{K}_2\text{O}$  4.97%, confirming the ratio 2:1 for Na:K. The infra-red absorption spectrum shows bands corresponding to those of both  $\text{H}_2\text{O}$  and (OH)-groups; the formula might be written as



A dehydration curve shows gradual loss of weight from 100 to 430°. The loss of weight at 1100°, 26.84%, corresponds nearly to  $\text{H}_2\text{O} + \text{Cl}$ . The DTA curve shows a large endothermic peak at 420° and an exothermic peak at 760°.

X-ray powder data (Fe anode) are given, and are indexed on an orthorhombic unit cell, with  $a$  12.62,  $b$  18.64,  $c$  6.97 Å.,  $Z=4$ . The strongest lines (51 given) are 9.5 (9)(020), 6.3 (9)(200), 4.01 (9)(041), 3.51 (8)(330, 002), 3.20 (10)(151), 400, 2.441 (8)(520), 1.966 (8)(560), 1.940 (7)(532), 1.612 (6)(671, 590), 1.508 (6)(424, 293).

Color white. Occurs as dense aggregates which crumble under light pressure into a fine chalk-like powder, consisting of grains (0.001–0.003 mm) usually irregular in form, rarely

as tabular rhombic forms up to 0.02 mm long along the long diagonal. The acute angle of the rhombs is 80°.  $\rho$  2.10, corrected for 31% boracite 1.70. Optically biaxial, neg.,  $2V$  very small,  $n_s \alpha$  1.535,  $\beta$  1.552,  $\gamma$  1.552 (all  $\pm$  0.002).

The mineral occurs as rounded aggregates up to 6–8 mm in diameter in clay-polyhalite-halite, clay-boracite-polyhalite, rarely clay-kieserite-polyhalite rocks of Kungur age; also occurs within crystals of kaliborite, and with halite fills fissures in clay-polyhalite rocks.

The name is for the locality, which is not given (apparently in the Kazakh SSR). The mineral and name were approved in advance of publication by the Commission on New Minerals and Mineral Names, IMA.

#### Phosphotorogummite, Hydroauerlite

V. S. KARPENKO, N. G. NAZARENKO, AND O. V. SHCHIPANOVA, (1967) New occurrences of minerals containing U, Th, Nb, and rare earths. *Vop. Priklad. Radiogiol., Atomizdat*, p. 100–121; [Abstr. *Zap. Vses. Mineral. Obshch.* 98, 330.]

Name given to varieties of thorite or thorogummite containing  $P_2O_5$  4.28, 5.52, and 9.55% in 3 analyses with high contents of  $H_2O$ . Metamict.  $\rho$ . 3.9–4.6,  $n$  1.628–1.688. Occur in dikes of alkalic rocks at the contact with serpentinite.

DISCUSSION.—The abstractor considers the names unnecessary. I agree.

#### Tosalite, Dosulite

TOHOFUMI YOSHIMURA (1967) Supplement to manganese ore deposits of Japan. Part I. Manganese mineralization, minerals, and ores. *Sci. Rept. Fac. Sci. Kyushu Univ., ser. D*, 9, 1–485. [In Japanese with English summary].

##### *Tosalite*

Chemical analysis of the material from the Matsuo mine, Kochi prefecture by H. Shirozu gave  $SiO_2$  32.09,  $TiO_2$  0.05,  $Al_2O_3$  5.59,  $Fe_2O_3$  4.13,  $FeO$  34.73,  $MnO$  9.85,  $CaO$  0.04,  $MgO$  2.04,  $Na_2O$  0.15,  $K_2O$  0.13,  $H_2O^+$  10.50,  $H_2O^-$  0.59, sum 99.89%, corresponding to the iron-richer member of 'bementite'.

Under the microscope, it is yellow green to bright green and the birefringence is variable. The optical data are not given. The X-ray powder data for the Matsuo material are 7.22 (10), 3.58 (5), 3.55 (2b), 2.76 (4), 2.47 (5), 2.34 ( $\frac{1}{2}$ ), 2.06 (2), 1.94 ( $\frac{1}{2}$ )/ 1.605 (3) and 1.567 (2), very similar to those for 'bementite'.

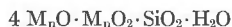
It occurs in dark green massive aggregates composed of fine grains with rhodochrosite and locally with magnetite.

The name is for Tosa, the old district name of Kochi prefecture, Japan.

Besides the original locality, six localities are known in Japan.

##### *Dosulite*

The name is given to an amorphous hydrous silicabearing manganese oxide ore from the Dosu mine, Tokushima prefecture, and some other localities. The chemical analysis of the original material has not been made, but the material from the Nishiyama mine, Oita prefecture, by Z. Moriyama gave  $SiO_2$  11.86,  $TiO_2$  0.12,  $Al_2O_3$  1.06,  $Fe_2O_3$  1.30,  $MnO$  73.01,  $O$  3.73,  $CaO$  5.44,  $MgO$  1.73,  $CO_2+H_2O^+$  0.84,  $H_2O^-$  0.16, sum 99.25%.  $\rho$  4.06. This leads to the ideal formula



The analyzed material is massive and chestnut brown in colour. The original material is reddish brown and massive with conchoidal fracture. Under the microscope, it is isotropic and darker than braunite. In transmitted light, it is reddish brown to purple brown, generally turbid, some translucent. Probably  $n=1.8$ .

The X-ray powder study by M. Yoshinaga gave the following strong lines: 6.92 (12), 6.19 (4), 3.46 (8), 3.36 (5), 3.28 (13), 3.10 (6), 2.85 (7), 2.78 (18), 2.73 (24), 2.68 (13), 2.63 (15), 2.58 (8), 2.50 (5), 2.33 (5), 2.26 (2), 2.17 (6), 1.81 (4), 1.68 (5), 1.60 (4), 1.53 (6), 1.59 (3). These may be also interpreted as those of 'bementite' or aluminian chlorite, rhodochrosite, tephroite-alleganyite-sonolite, and an unknown mineral (neotocite?). The locality of the X-ray studied material is not stated.

The name is for the original locality.

The associated mineral in the Nishiyama mine is rhodochrosite, where the close association with manganosite is also known. *Akria Kato*

### Craigite

S. L. MILLER (1969) Clathrate hydrates of air in Antarctic ice. *Science* 165, 489-490.

It has been observed that air bubbles are present in Antarctic ice to a depth of 1200 m.; no bubbles are seen in ice from lower depths, but air is still present because gas is evolved when the ice is melted. This can be explained by assuming the presence of the known cubic clathrate compounds  $O_2 \cdot 5 \frac{3}{4} H_2O$  and  $N_2 \cdot 5 \frac{3}{4} H_2O$  or  $(Na_2 O_2) \cdot 5 \frac{3}{4} H_2O$  ("a hydrate of air"). Calculations based on measured dissociation pressures indicate that "air hydrate" should be stable at depths greater than 800 m and should be present in amounts of 0.06% of the ice.

The name is for Harmon Craig, geochemist, University of California, San Diego.

DISCUSSION.—The reasoning appears to be sound, but the material has not been actually observed to occur. The terminology "air hydrate" is grotesque.

### Djerfisherite

A. D. GENKIN, N. V. TRONEVA, AND N. N. ZHURAVLEV (1969) The first occurrence in ores of the sulfide of potassium, iron and copper, djerfisherite. *Geol. Rudnykh. Mestorozhd.* 11 (5), 57-64 [in Russian].

A mineral found in the Talnakh copper-nickel deposit is shown to be the meteorite mineral djerfisherite [*Amer. Mineral.* 51, 1815 (1966)]. The average of two micro-X-ray spectrographic analyses was K 8.25, Cu 15.5, Fe 43.5, Ni 1.5, S 33.5, sum 102.25%, corresponding to  $K_3Cu_3(Fe,Ni)_{11}S_{14}$ , whereas the meteorite mineral had the formula  $K_3Cu(Fe,Ni)_{12}S_{14}$ . The X-ray pattern shows it to be cubic,  $a$   $10.34 \pm 0.01 \text{ \AA}$ ., the strongest lines are 10.4 (6)(100), 3.33 (7)(310), 3.17 (7)(311), 3.03 (7)(222), 2.38 (6)(331), 1.843 (10)(440), 1.301 (5)(800). Isotropic. Reflectances are given at 16 wave lengths, increasing with wave length: 440 nm, 17.8%; 480, 19.7%; 540, 22.5%; 580, 23.8%; 660, 25.5%; 740, 26.0%. Microhardness 172 kg/mm. Polishes well.

The mineral occurs with talnakhite, chalcopyrite, and pentlandite, also magnetite, valleriite, sphalerite, and Pt minerals. It replaces pentlandite.

### Preobrazhenskite

I. V. OSTROVSKAYA AND I. B. NIKITINA (1969) The formula of preobrazhenskite. *Tr. Mineral. Muz. Akad. Nauk SSSR* 19, 206-209 [in Russian].

The formula of preobrazhenskite has previously been given as  $3MgO \cdot 5B_2O_3 \cdot 4\frac{1}{2} \cdot 5 H_2O$  [see *Amer. Mineral.* 42, 704 (1957)], also as  $4MgO \cdot 7B_2O_3 \cdot 7H_2O$ , and as  $5MgO \cdot 9B_2O_3 \cdot 8H_2O$ . None of the formulas gave, with the determined sp. gr., satisfactory unit cell constants. A new analysis by I. B. N. was made on type material which had been washed with water to remove water-soluble chlorides and sulfates. This gave  $B_2O_3$  65.90,  $MgO$  20.65,  $CaO$  none,  $R_2O_3$  0.17,  $SiO_2$  0.30,  $H_2O^-$  0.16,  $H_2O^+$  13.39, sum 100.57%, corresponding to  $3MgO \cdot 5.5B_2O_3 \cdot 4.34H_2O$  or  $Mg_3B_{11}O_{15}(OH)_9$ . With  $Z=4$  in the unit cell, this gives good agreement with the measured sp. gr. Spectrographic analysis also showed thousandths of a percent of Na, Cu, Al, Fe, and Ca. A dehydration curve showed little loss of weight to 520° and a loss

of about 15% ( $\text{H}_2\text{O} + \text{some B}_2\text{O}_3$ ) at 520–600°. The infra-red absorption spectrum shows no band for  $\text{H}_2\text{O}$  but shows that of  $(\text{OH})^-$ ; the presence of boron in both 3-fold and 4-fold coordination is indicated. The formula may be  $\text{Mg}_3\text{B}_6^{\text{IV}}(\text{B}_3^{\text{III}}\text{O}_{15}(\text{OH}))_9$ .

#### Chile-Löweite-Humberstonite

ROBERT KÜHN, AND RENATE VON HODENBERG (1969) Bemerkungen zum Chilelöweit = Humberstonit,  $(\text{Na}, \text{K})_{10}\text{Mg}_2(\text{SO}_4)_6(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ . *Kali Steinsalz* 5, 190.

A new analysis and X-ray study of chile-löweite, described by Wetzel (1928) (*Dana's System, 7th Ed., v. 2, p. 447*) showed that it is identical with humberstonite [*Amer. Mineral.* 53, 507 (1968)]. The three available analyses show that the ratio  $\text{K}_2\text{O}/\text{Na}_2\text{O}$  ranges from 1:2.33 to 1:2.87. The name chile-löweite has priority, but the authors recommend that it be discarded, since the mineral is not related to löweite.

#### Mackayite

R. V. GAINES (1965) Nuevos datos sobre mackayita. *Bol. Soc. Geol. Mexicana* 28, 75–82.

F. PERTLIK (1968) Formel und Struktur von Mackayit,  $\text{Fe}(\text{OH})[\text{Te}_2\text{O}_2]$ . *Anz. Oesterr. Akad. Wiss., Math-naturw. K.* 105, 332–333 [1968].

Mackayite was described by Frondel and Pough in 1944 (see *Dana's System, 7th Ed., v. 2, p. 642*) as probably a hydrous ferric tellurite. Gaines describes the mineral from a new locality; Pertlik describes synthetic material. Both give X-ray data close to those in the original description: Gaines found the mineral to be tetragonal,  $I/4\text{acd}$ ,  $a$  11.704,  $c$  14.885 Å, Pertlik gives tetragonal,  $I4_1/\text{acd}$ ,  $a$  11.704,  $c$  14.984 Å. However, they derive different formulas, as shown by the following analyses.

	1	2	1A	2A	3
$\text{TeO}_2$	57.16	60.74	65.82	65.32	78.6
$\text{Fe}_2\text{O}_3$	19.14	20.15	22.04	21.67	19.5
$\text{Al}_2\text{O}_3$	12.69	1.00	—	—	—
Insol.		4.68	—	—	—
$\text{CaO}$		—	0.32	—	—
$\text{H}_2\text{O}$	10.54	12.09	12.14	13.00	1.7
	99.53	98.98	100.0	100.0	99.8

1. Gaines on 186 mg.

2. Gaines on 359 mg.

3. Pertlik.

1a, 2a—recalculated after deducting impurities.

Gaines' analyses give the formula  $\text{Fe}_2\text{O}_3 \cdot 3\text{TeO}_2 \cdot 5\text{H}_2\text{O}$  (unit cell content  $\text{Fe}_{16}\text{Te}_{24}\text{O}_{72} \cdot 40\text{H}_2\text{O}$ );

Pertlik's gives the formula  $\text{FeTe}_2\text{O}_5(\text{OH})$  (unit cell content  $\text{Fe}_{16}\text{Te}_{32}\text{O}_{80}(\text{OH})_{16}$ ).

Gaines found no loss of water below 475°, it was lost entirely at 640°.

#### Keldyshite, Unknown phase

A. P. KHOMYAKOV, M. E. KAZAKOVA, AND A. A. VORONKOV (1969) New data on keldyshite. *Dokl. Akad. Nauk SSSR* 189, 166–168.

Previous data are given in *Amer. Mineral.* **47**, 1216 (1962). New data are given from another drill core in foyaitite, Lovozero massif. A new analysis on 200 mg (by M.E.K.) gave SiO<sub>2</sub> 39.69, ZrO 39.53, TiO<sub>2</sub> 0.32, Fe<sub>2</sub>O<sub>3</sub>+FeO 0.26, CaO 1.37, Na<sub>2</sub>O 18.35, K<sub>2</sub>O trace, H<sub>2</sub>O not found, sum 99.52%, corresponding to Na<sub>2</sub>ZrSi<sub>2</sub>O<sub>7</sub>. This is close to the original analysis except for the absence of K and H<sub>2</sub>O.

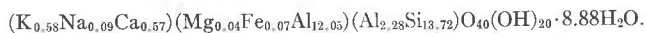
Unindexed X-ray powder data are close to those previously given. The strongest lines are 4.18 (80), 3.99 (100), 3.38 (28), 2.97 (52), 2.90 (32), 2.83 (28), 2.67 (36), 2.62 (32), 2.42 (28), 2.16 (28), 1.998 (28), 1.903 (28), 1.708 (32), 1.103 (28). Laue photographs indicated triclinic symmetry, space group probably  $P\bar{1}$ ,  $a$  6.66,  $b$  8.83,  $c$  5.42 Å,  $\alpha$  92°45',  $\beta$  94°13',  $\gamma$  72°20'.

A second phase present was biaxial,  $2V \pm 90^\circ$ ,  $ns \alpha$  1.670,  $\gamma$  1.710 (same as keldyshite),  $\rho$ .  $3.2 \pm 0.1$ . The strongest lines (33 given) were 5.62 (35), 4.72 (40), 4.18 (65), 3.98 (60), 3.20 (35), 2.910 (100), 2.712 (65), 2.225 (40). No chemical data could be obtained.

### Tosudite

SUSUMU SHIMODA (1969) New data for tosudite. *Clays Clay Minerals* **17**, 179-184. See *Amer. Mineral.* **49**, 816.

The mineral was found in altered wall rocks of Au-Ag-quartz veins of the Takatama mine, Fukushima Prefecture, Japan. Analysis of a sample purified by sedimentation gave SiO<sub>2</sub> 42.14, Al<sub>2</sub>O<sub>3</sub> 37.38, Fe<sub>2</sub>O<sub>3</sub> 0.30, MgO 0.08, CaO 1.65, Na<sub>2</sub> 0.15, K<sub>2</sub>O 1.40, H<sub>2</sub>O<sup>-</sup> 6.16, H<sub>2</sub>O+11.22 sum 100.48%, corresponding to



X-ray study shows a 30.4 Å spacing, shifted to 27.8 Å when the mineral is heated to 300°. DTA, TGA, and infrared data are given.

The mineral is a regularly interstratified montmorillonite-dioctahedral chlorite.

### Idrialite, Olefinitite

E. A. GLEBOVSKAYA (1968) Molecular spectroscopy in the study of organic materials. *Khim. Tverd. Topl.* **1968**, no. 3, 145-148 [in Russian].

Infrared and ultraviolet spectra were obtained for idrialite (curtisite) (*Dana's System*, 6th Ed., p. 1013; *Amer. Mineral.* **50**, 2109 (1965)) and olefinitite. Idrialite is probably either 2, 9-dimethyl-benzphenanthrene or 2-methyl-3,4-benz-phenanthrene. Olefinitite contains unsaturated bonds and aromatic groups.

### Discredited Minerals

#### Anauxite

V. T. ALLEN, J. J. FAHEY, AND MALCOLM ROSS (1969) Kaolinite and anauxite in the Ione Formation, Calif. *Amer. Mineral.* **54**, 206-211.

S. W. BAILEY, AND R. B. LANGSTON, (1969) Anauxite and kaolinite structures identical. *Clay Clay Minerals* **17**, 241-342.

Chemical study shows that anauxite from Ione contains excess silica over the kaolinite formula; treatment with NaOH solution leaches out the excess silica, probably present in the amorphous form. X-ray study shows that the material is structurally identical with kaolinite.

### ERRATUM

#### Sogdianovite

To the analysis [*Amer. Mineral.* **54**, 1221 (1969)] add Li<sub>2</sub>O 3.73%.