

NEW MINERAL NAMES

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Fersilicite, Ferdasilicite

- V. KH. GEVORK'YAN (1969) The occurrence of natural ferrosilicon in the northern Azov region. *Dokl. Akad. Nauk SSSR*, **185**, 416-418 (in Russian).
- V. KH. GEVORK'YAN, A. L. LITVIN, AND A. S. POVAREN'NYKH (1969) Occurrence of the new minerals fersilicite and ferdasilicite. *Geol. Zh. (Ukraine)* **29** No. 2, 62-71 (in Russian).

In placers and in drill-core samples of sandstones of the Poltava series near Zachativsk station, Donets region, fragments 0.1 to 3 mm in size were found of material with strong steely luster, although many of the grains are covered by a dark gray opaque film. Chemical analyses by N. V. Tananaev of fractions of size >1 mm and 0.25-0.5 mm gave, resp.; Fe 52.09, 50.51; Si 43.25, 41.45; TiO₂ 0.05, 0.55; Al₂O₃ 1.30, 2.70; MnO 0.65, 2.56; MgO 0.18, 0.32; CaO 0.92, 0.42; Na₂O not detd., 0.15; K₂O not detd., 0.01; NiO 0.30, not detd., sum 98.74 (given as 99.74), 98.67 (given as 100.67%). Spectrographic analyses by E. S. Nazarevich showed also Co 0.06, 0.06; V 0.003, 0.003, Cr 0.2, 0.03; Zr 0.003 (?), 0.04; Cu 0.6, 0.3; Zn 0.01, 0.02; Sn 0.02, 0.02%. The analyses correspond approximately to Fe₃Si₃.

Optical and X-ray data showed that the material consists of two distinct phases, a cubic phase with a 4.48 ± 0.012 Å corresponding to synthetic FeSi, and a tetragonal phase with a 2.69 ± 0.012, c 5.08 ± 0.02 Å, corresponding to synthetic FeSi₂.

The cubic phase, named fersilicite, has strongest lines 3.143 (5)(110), 2.566 (5)(111), 1.991 (10)(210), 1.817 (9)(211), 1.347 (5)(311), 1.196 (10)(321), 1.119 (5)(400), 1.028 (9)(331), 0.978 (9)(421). The tetragonal phase, named ferdasilicite, has strongest lines 5.009 (6)(001), 2.371 (9)(101), 1.893 (6)(110), 1.846 (10)(102), 1.775 (9)(111), 1.343 (5)(200), 1.270 (5)(113), 1.171 (5)(211), 1.089 (10)(212), 1.064 (7)(—), 1.057 (5)(203).

Fersilicite is tin-white, microhardness 776-838, av. 812 kg/sq. mm. (about 6.5 Mohs), brittle, ρ 6.18 (calc) No cleavage, conchoidal fracture. Isotropic, reflectivity 39%. Ferdasilicite is steel-gray, microhardness 707-811, av. 759 kg/sq. mm. (about 6.25 Mohs), brittle, ρ 5.05 (calc) No cleavage, conchoidal fracture. Reflectivity 36%.

The mineral was found in more than 40 drill cores from an area of 4 × 1.8 km at depths of 5 to 90 meters in amounts up to 250 kg/m³ but averaging 3-5 kg/m³. They were found after concentration with heavy liquids to be almost entirely in the non-magnetic fraction; with zircon, rutile, corundum, topaz, braite, and pyrite. They were not found in the crystalline rocks of the region. The grains are serrated, specular, dendritic with only traces of crystal forms; rare intergrowths with quartz were noted. It is mentioned that ferdasilicite was found in a drill core of epidote amphibolite, in the Surskii region, 300 km away.

The possibility that the minerals are of artificial origin is discussed and is dismissed because no such compounds were used in the drill bits, nor was acetylene welding of the bits used, and the mineral were found in placers far from the drill holes. The large total amount found indicates that the minerals are not of meteoritic origin.

The names are for the chemical composition.

DISCUSSION.—Further study, especially microprobe analyses and optical study, is needed.

Olshanskyite

- M. A. BOGOMOLOV, I. B. NIKITINA, AND N. N. PERTSEV (1969) Olshanskyite, a new calcium borate. *Dokl. Akad. Nauk SSSR* **184**, 1398-1401 (in Russian).

Analysis by I.B.N. gave B₂O₃ 27.95, CaO 34.81, MgO 1.79, Al₂O₃ 0.15, Fe₂O₃ 0.17, SiO₂

0.36, CO₂ 2.36, H₂O 0.55, H₂O⁺ 32.27, total 100.41%. After subtracting szaibelyite (calc from MgO), calcite (calc from CO₂), limonite, and SiO₂, this gives CaO:B₂O₃:H₂O=3.00:2.00:2.98. The infra-red absorption spectrum shows bands of hydroxyl, but not of molecular H₂O and the formula is therefore written Ca₃[B(OH)₄]₄(OH)₂. Dissolved easily by acids.

The DTA curve shows a sharp endothermic peak at 270° and a sloping break at 400–450° (loss of weight up to 500°=32%) two exothermic peaks at 670° and 720°, and a weak endothermic effect at 740°–830° (probably due to calcite).

The mineral occurs as transverse-fibrous aggregates of polysynthetically twinned crystals, 0.02–0.03 mm in size. Single crystal photographs could not be obtained. Apparently monoclinic, but might be triclinic. X-ray powder data are given (17 lines); the strongest lines are 7.61 (5), 6.78 (5), 3.35 (5), 3.05 (8), 2.81 (10).

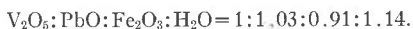
Colorless. H. 4, ρ 2.23. Optically biaxial, negative, $n_s \alpha 1.557 \pm 0.002$, $\beta 1.568$ (calc), $\gamma 1.570 \pm 0.002$, $2V 54 \pm 2^\circ$, $r > v$ weak, elongation negative, extinction inclined at a smaller angle. In thin sections prepared with Canada balsam, the mineral is decomposed.

Occurs as veinlets in sakaite (*Amer. Mineral.* 51, 1817) in "magnesian skarn, Eastern Siberia." The name is for Yakov Iosifovich Ol'shanskii (1912–1958), specialist in physical geochemistry. The mineral was approved before publication by the Commission on New Minerals and Mineral Names, IMA.

Mounanaite

FABIEN CESBRON AND JEAN FRITSCHÉ (1969) La mounanaite, nouveau vanadate de fer et de plomb hydrate. *Bull. Soc. Fr. Mineral. Cristallogr.* 92, 196–202.

Sufficient pure material for analysis could not be obtained. A mixture with iron hydroxides (J.F., analyst) gave V₂O₅ 22.70, PbO 27.80, Fe₂O₃ 40.10, H₂O 8.97, sum 99.57% (ratio V₂O₅:PbO=1). Synthetic crystals gave V₂O₅ 31.47, PbO 39.82, Fe₂O₃ 25.20, H₂O 3.56, sum 100.05%.



The formula is therefore PbFe₂(VO₄)₂(OH)₂.

Crystals (identity with mineral checked by X-ray study) were obtained by adding a solution of V₂O₅ in warm H₂O + a little H₂O₂ to a solution of ferric nitrate and lead nitrate in molar ratios, respectively, of 0.8 to 1 to 0.4, decanting, washing the amorphous precipitate, and heating in a sealed tube at 180°C for 3–4 days. The DTA curve of synthetic material showed endothermic breaks at 490° (loss of water) and 635° (fusion) and an exothermic peak at about 600°.

Rotation photographs showed the mineral to be triclinic, space group $P\bar{1}$ $a 5.55$, $b 7.66$, $c 5.56$ (all $\pm 0.02 \text{ \AA}$), $\alpha 111^\circ 01'$, $\beta 112^\circ 07'$, $\gamma 94^\circ 09'$ (all $\pm 20'$), $Z=1$. There is a pseudomonoclinic cell with $[10\bar{1}] 9.22$, $[101] 6.20$, $[011] 7.68 \text{ \AA}$, and angles $88^\circ 52'$, $115^\circ 22'$ and $90^\circ 07'$; this is not very different from the monoclinic cell of brakebuschite, Pb₂(Fe, Mn)(VO₄)₂·H₂O, but the minerals have considerably different X-ray powder photographs and chemistry. Crystals of mounanaite are elongated on c and platy on (010). Forms noted are {010} a (dominant), {100}, {110}, {011}, {11 $\bar{1}$ }, {12 $\bar{1}$ }, {02 $\bar{1}$ }, {01 $\bar{1}$ }, {021}. Most crystals are twinned by rotation around [001] or on (1 $\bar{1}$ 1).

Color brownish-red. $\rho 4.85$ (meas), 4.89 calculated from x-ray data. Optically biaxial; the sign could not be determined because of the twinning. An optic axis is nearly perpendicular (within 3–4°) to (010). On (010) the extinction is at 38° to c ; pleochroic, in this direction brownish-red, at 90° brownish-yellow. The n_s are all above 2.09.

The mineral occurs in very small amounts in the U-V deposit of Mounana, Haut-Ogoue, Gabon, Africa (the type locality for francevillite, chervitite, vanuralite, and curienite), associated with goethite, francevillite, and curienite.

The mineral is named for the locality. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA.

Henritermierite

C. GAUDEFROY, M. ORLIAC, F. PERMINGEAT, AND A. PARFENOFF (1969) L'henritermiérite, une nouvelle espèce minérale. *Bull. Soc. Fr. Mineral. Cristallogr.* **92**, 185–190.

ANDRE AUBRY, YVES DUSAUSOY, ALAIN LAFFAILLE, AND JEAN PROTAS (1969) Détermination et étude de la structure cristalline de l'henritermiérite, hydrogrenat de Symétrie quadratique. *Bull. Soc. Fr. Mineral. Cristallogr.* **92**, 126–133.

Chemical analysis by M. Orliac on 1 g gave SiO₂ 24.65, Al₂O₃ 5.95, Fe₂O₃ 0.95, MnO 22.38, active O₂ 2.56, CaO 35.45, H₂O⁺ 7.85, H₂O⁻ 0.08, sum 99.87%. Electron microprobe analysis by R. Giraud gave SiO₂ 26.6, Al₂O₃ 5.5, Fe₂O₃ 1.0, MnO 20.9, CaO 35.1%. The complete analysis gives



corresponding chemically to the manganic analogue of hydrogrossular. The mineral is slowly dissolved by cold HCl, easily in warm HCl, leaving a silica residue. Nitric acid attacks it superficially with formation of black MnO₂. The DTA curve shows a large endothermic reaction starting at 480°, with peak at 640° (loss of water), an exothermic peak at 830°, and a large endothermic peak at 1020°. The TGA curve shows a loss of weight of 0.6% at 500° and then gradual loss of weight amounting to 8.1% at 900°. The X-ray pattern of material heated to 1020° is that of a garnet plus some lines of braunite.

Weissenberg photographs show the mineral to be tetragonal, space group *I4₁/acd*—*D*²⁰_{8h}, with *a* 12.39, *c* 11.91 both ± 0.01 Å, *Z* = 8. The structure is given in detail; it is a deformed garnet structure with partial replacement of SiO₄ by (OH)₄ tetrahedra. The X-ray powder pattern is given (40 lines); the strongest are 4.37 (s)(220), 3.09 (s)(040), 2.98 (s)(004), 2.75 (vvs)(042), 2.684 (ms)(024), 2.516 (vs)(242), 1.614 (ms)(246).

The mineral is clove- to apricot-brown, luster vitreous. Commonly twinned on (101), giving 4 sectors. No cleavage, fracture conchoidal. $\rho = 3.34 \pm 0.02$ (meas); 3.40 calculated from X-ray data. Hardness not determinable. Optically positive, mainly uniaxial with some grains anomalously biaxial with small *2V*, *ns* ω 1.765, ϵ 1.800 (both ± 0.005), weakly pleochroic with *O* very pale yellow, *E* lemon-yellow.

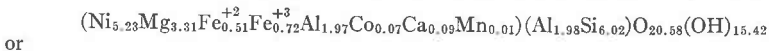
The mineral occurs in aggregates of small grains up to 0.5 mm; mostly about 0.2 mm in diameter, filling interstices between crystals of marokite, hausmannite, and rare gaudefroyite in the Tachgagalt manganese mine, Morocco. Calcite is commonly present.

The name is for Henri Termier, professor of geology at the Sorbonne (termierite has been used for a dubiou clay mineral). The mineral and name were approved in advance of publication by the Commission on New Minerals and Mineral Names, IMA.

Nimite

S. A. HIEMSTRA AND S. A. DE WAAL (1968) Nickel minerals from Barberton. II. Nimite, a nickelian chlorite. *Nat. Inst. Met. (South Africa) Res. Rep.* **344**, 1–10.

Analysis gave SiO₂ 27.27, Al₂O₃ 15.21, Fe₂O₃ 4.35, FeO 2.78, NiO 29.49, CoO 0.38, MgO 10.13, MnO 0.06, CaO 0.38, H₂O⁺ 10.48, H₂O⁻ 0.27, sum 100.80%, corresponding to



or



a member of the chlorite group with Ni predominant. The analyzed sample was estimated to be more than 98% pure; it contained a little ferroan trevorite and willemseite (see below).

X-ray diffractometer data were refined by computer. Nimate is monoclinic, space group $C2/m$ assumed, a 5.320, b 9.214, c 14.302 (all $\pm 0.002\text{\AA}$), β $97.10 \pm 0.01^\circ$. The strongest lines (29 given) are 14.2 (25)(001), 7.10 (100)(002), 4.74 (16)(003), 3.55 (45)(004), 2.841 (7)(005).

The mineral is yellowish-green (10GY 5/4), H. 3, $\rho = 3.12$ (Berman balance) 3.19 (Clerici solution), calculated 3.20. Optically biaxial, negative, $ns \alpha$ 1.637, $\beta = \gamma$ 1.647 ± 0.002 , $2V$ $15 \pm 2^\circ$. Cleavage {001} pronounced. Pleochroism faint; in thick sections X greenish-yellow, Z apple-green (private communication to M.F.). The infra-red absorption spectrum is similar to those of other chlorites.

The mineral occurs in a small tabular body of nickeliferous rocks at the contact between quartzite and ultramafic rocks, about two miles west of the Scotia talc miner, Barberton Mountain Land, Transvaal. Associated minerals include ferroan tremolite, violarite, milnerite, willemseite, and secondary reevesite and goethite.

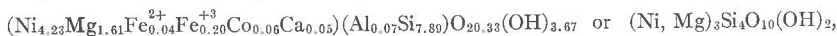
The name is for the abbreviation of the National Institute of Metallurgy.

DISCUSSION.—This is clearly a valid species. It is a pity that the authors did not use the old name schuchardtite, which has been used by several authors for the synthetic Ni chlorites. All available analyses of natural schuchardite show $Ni < Mg$, however, and this name should now be relegated to the synonymy.

Willemseite

S. A. HIEMSTRA AND S. A. DE WAAL (1968) Nickel minerals from Barberton, III. Willemseite, a nickelian talc. *Nat. Inst. Met. (South Africa) Res. Rep.*, **352**, 1–14.

Analysis gave SiO_2 51.83, Al_2O_3 0.38, Fe_2O_3 1.77, FeO 0.31, NiO 34.55, CoO 0.46, MgO 7.09, MnO none, CaO 0.28, H_2O^+ 3.61, H_2O^- 0.05, sum 100.33%, corresponding to



the nickel analogue of talc and minnesotaite. The analyzed sample contained less than 2% impurities, mainly tremolite and goethite.

X-ray diffractometer data were refined by computer; the mineral is monoclinic, a 5.136, b 9.149, c 18.994 (all ± 0.002) \AA , β $99.96 \pm 0.01^\circ$. The strongest lines (30 given) are 9.40 (100)(002), 4.57 (16)(020), 3.12 (28)(006), 2.503 (23)(133), 2.245 (8)(135).

The mineral is light green (Rock Color Chart no. 5 G 7/4), H. 2, $\rho = 3.28$ (Berman balance), 3.31 (Clerici), 3.348 (calc). Optically biaxial, negative, α 1.600, β 1.652 ± 0.002 , γ 1.655 (calculated) $2V$ $27 \pm 2^\circ$. The infrared absorption spectrum is given.

The occurrence is as given above for nimate. The name is for the late Johannes Willemse, Professor of Geology at the University of Pretoria, South Africa.

Pecoraite

G. T. FAUST, J. J. FAHEY, BRIAN MASON, AND E. J. DWORNIK, (1969) Pecoraite, $Ni_6Si_4O_{10}(OH)_8$, nickel analog of clinochrysoile, formed in the Wolf Creek meteorite. *Science* **165**, 59–60.

Analysis on 0.1 g. gave SiO_2 31.0, NiO 51.5, FeO 0.7, MgO 0.5, Al_2O_3 1.4, H_2O^+ 9.7, H_2O^- 4.1, CaO 0.4, total 99.3%. Deducting about 1% of the phosphate cassidyite (*Amer. Mineral.* **52**, 1190) as calculated from CaO , and the H_2O^- , this gives $(Ni_{5.41}Mg_{0.10}Fe_{0.05}Al_{0.22})Si_{4.05}O_{10}(OH)_8$.

X-ray powder data are very similar to those for clinochrysoile except for line broadening due to the extremely fine-grained nature of the material. The strongest lines are 7.43 (8)(002), 4.50 (5)(020), 3.66 (004)(6), 2.620 (5)(130), 2.447 (4)(202), 1.529 (6)(060). Electron microscope photographs show aggregates of curved plates (calculated to have average thickness of 70 \AA) and spirals.

The mineral occurs as green grains (Ridgway "Oriental green"), 0.1 to 5 mm in diameter, filling cracks in the Wolf Creek meteorite, Western Australia. It is associated with maghemite and quartz, and less cassidyite, reevesite, and quartz. It is weakly doubly refracting with ns varying from 1.565 to 1.603, depending on the amount of adsorbed water. After drying over magnesium perchlorate, the mean n is close to 1.650. G. of material containing adsorbed water is 3.084.

The name is for W. T. Pecora, Director of the U. S. Geological Survey, in recognition of his contributions to the mineralogy and geology of nickel silicate deposits. The mineral and name were approved in advance of publication by the Commission on New Minerals and Mineral Names, IMA.

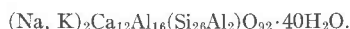
Roggianite

ELIO PASSAGLIA (1969) Roggianite, nuovo minerale silicite (abstr.). *Rend. Soc. Ital. Mineral. Petrol.* **25**, 105-106.

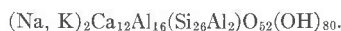
Analysis (not given) leads to the formula



which is simplified to



The water is lost only at 875°, so that hydroxyl is present and the formula becomes



The DTA curve shows small endothermic peaks at 110° and 874°, a large exothermic peak at 200-500° and a small exothermic peak at 910°.

Rotation photographs gave a 18.37 ± 0.07 , c 9.14 ± 0.04 Å. Space group and symmetry not stated.

The mineral occurs in white or yellowish-white fibrous aggregates in fractures in a vein of sodium feldspar at Alpe Rosso, Val Vigezzo, Novare, Italy. $\rho = 2.02$. $ns \omega$ 1.5.27, ϵ 1.535 (both ± 0.001).

The name is for Aldo G. Roggiani, Italian mineralogist. The mineral was approved before publication by the Commission on New Minerals and Mineral Names, IMA.

A full description is to be published.

NEW DATA

Raguinite

ZDENEK JOHAN, PAUL PICOT, AND ROLAND PIERROT (1969) Nouvelles donnees sur la raguinite. *Bull. Soc. Fr. Mineral. Cristallogr.* **92**, 237.

Rotation photographs show the mineral to be orthorhombic, a 12.40, b 10.44, c 5.26 (all ± 0.05 Å), $z = 8$. $\rho = 6.29$ (Calc), 6.4 ± 0.2 (meas). Comparison with tetragonal chalcopyrite ($a = b = 5.25$, $c = 10.32$ Å, $Z = 4$) indicates that raguinite has a deformed chalcopyrite structure. The strongest lines are indexed: 4.17 (s)(300), 3.35 (s)(130), 2.89 (vvs)(031), 2.64 (ms)(002, 231).

Rancieite

W. E. RICHMOND, MICHAEL FLEISCHER, AND MARY E. MROSE (1969) Studies on manganese oxide minerals. IX. Rancieite: *Bull. Soc. Fr. Mineral Cristallogr.* **92**, 191-195.

Analysis by M.F. of material from Oriente Province, Cuba, shown by X-ray data to be identical with type material, gave MnO₂ 75.04, MnO 3.31, MgO 0.16, CaO 8.10, Na₂O 0.12, K₂O 0.26, Fe₂O₃ 0.12, Al₂O₃ 0.12, CuO 0.02, H₂O- 1.53, H₂O+ 11.09, SiO₂ 0.62, P₂O₅ 0.10, total 100.50%, corresponding to



Other analyses in the literature do not agree well with this formula.

A loss of weight curve (static method) showed rapid loss of weight to 11.0% at 220°, then a gradual and continuous loss to 16.74% at 980°. No change in X-ray pattern was found for a sample heated to 150° (loss of weight 9.33%).

X-ray powder data are given for several samples, several of which show lines of todorokite. The strongest lines on the best pattern are 7.492 (100), 3.744 (13), 2.463 (9).

DISCREDITED MINERALS

Tavistockite = Apatite

Bialite = Wavellite

P. G. EMBREY AND E. E. FEJER (1969) Tavistockite and bialite discredited. *Mineralog. Mag.* **37**, 123-127.

Examination of 17 specimens labelled tavistockite (Church, 1865) show that they fall into two groups: (1) from Tavistock, shown by X-ray study to be fluor-apatite or intermediate between fluor-apatite and carbonate-apatite; (2) from Stella Gwyn mine, Cornwall consisting of wavellite. The optical data recorded from tavistockite are for wavellite.

Bialite (Buttgenbach, 1925; abstr. *Amer. Mineral.* **14**, 439), supposedly a phosphate of Ca and Mg, is shown by X-ray study to be wavellite. A test for Mg showed that little, if any, Mg is present.

Approved before publication by the Commission on New Minerals and Mineral Names, IMA.

REDEFINITION

Magnesiocummingtonite

H. J. KISCH (1969) Magnesiocummingtonite— $P2_1/m$, a Ca- and Mn-poor clino-amphibole from New South Wales. *Contrib. Mineral. Petrology*, **21**, 319-331.

The nomenclature of the series of monoclinic amphiboles of composition $\text{Mg}_7\text{Si}_8\text{O}_{22}(\text{OH})_2$ — $\text{Fe}_7\text{Si}_8\text{O}_{22}(\text{OH})_2$ is reviewed. It is proposed that the entire series be called the cummingtonite series, those with $\text{Mg} > \text{Fe}$ magnesiocummingtonite (Tilley, 1939) and those with $\text{Fe} > \text{Mg}$ grunerite.

DISCUSSION.—The proposal was reviewed in advance of publication by the IMA Commission on New Minerals and Mineral Names, but action was deferred pending a recommendation by a subcommittee that is now studying the nomenclature of the entire amphibole group.