

New minerals approved in 2003 and nomenclature modifications approved in 2003 by the Commission on New Minerals and Mineral Names, International Mineralogical Association

ERNST A.J. BURKE^{1,*} (CHAIRMAN, CNMMN) AND GIOVANNI FERRARIS^{2,†} (VICE-CHAIRMAN, CNMMN)

¹Faculteit der Aard en Levenswetenschappen, Vrije Universiteit Amsterdam, De Boelelaan 1085, 1081 HV Amsterdam, Netherlands

²Dipartimento di Scienze Mineralogiche e Petrologiche, Università di Torino, Via Valperga Caluso 35, I-10125 Torino, Italy

The information given here is provided by the Commission on New Minerals and Mineral Names, I.M.A., for comparative purposes and as a service to mineralogists working on new species.

Each mineral is described in the following format:

IMA No.

Chemical Formula

Any relationship to other minerals

Structure analysis

Crystal system, space group

Unit-cell parameters

Color; luster; diaphaneity

Optical properties

Strongest lines in the X-ray powder diffraction pattern

The names of these approved species are considered confidential information until the authors have published their descriptions or released information themselves. No other information will be released by the commission.

2003 PROPOSALS

IMA No. 2003-001

(Ba,Ca,K,Na,Sr)₅Al₉Si₂₇O₇₂·22H₂O

Ba-dominant analogue of heulandite

Structure determined

Monoclinic: *C2/m*

a 17.738, *b* 17.856, *c* 7.419 Å, β 116.55°

Colorless to white, rarely very pale yellowish white; vitreous, pearly; translucent to transparent

Biaxial (+), α 1.5056, β 1.5064, γ 1.5150, 2*V*(meas.) 38°, 2*V*(calc.) 34.1°

7.94(66), 5.12 (59), 4.65(66), 3.978(97), 3.181(56), 2.973(100), 2.807(65)

IMA No. 2003-002

Na(Ba,Sr,Na,REE)PO₄

Ba-dominant analogue of olgite

Structure determined

Trigonal: *P3*

a 5.549, *c* 7.032(2) Å

Light-green; vitreous; transparent

Uniaxial (–), ω 1.628, ε 1.623

7.04(22), 3.964(60), 2.839(100), 2.774(100), 2.344(20), 1.984(40), 1.611(26)

IMA No. 2003-003

Ba₂Zn(Ti,Nb)₄(Si₄O₁₂)₂(O,OH)₄·7H₂O

Labuntsovitte group, kuzmenkoite subgroup

Structure determined

Monoclinic: *Cm*

a 14.381, *b* 13.889, *c* 7.793(2) Å, β 117.52°

Pale brown (light coffee-colored); vitreous; transparent

Biaxial (+), α 1.683, β 1.692, γ 1.795, 2*V*(meas.) 30°, 2*V*(calc.) 34.5°
6.95(37), 6.39(10), 4.91(6), 3.194(100), 3.101(22), 3.050(8), 2.906(6)

IMA No. 2003-004

(Cu,Fe)(Re,Mo)₄S₈

Cubic: *F4̄3m*

a 9.563 Å

Black; metallic; opaque

In reflected light: bluish-green, no internal reflections, isotropic.
R(air): 38.2 (470 nm), 37.9 (546 nm), 37.4 (589 nm), 36.6 (650 nm)
5.53(100), 2.885(90), 2.389(90), 2.194(70), 1.952(60), 1.841(90), 1.690(80)

IMA No. 2003-005

Ca₂(Zn, Mg)[PO₄]₂·2H₂O

Zn-dominant analogue of collinsite

Structure determined

Triclinic: *P1̄*

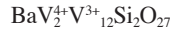
a 5.736, *b* 6.767, *c* 5.462 Å, α 97.41, β 108.59, γ 107.19°

Colorless, gray with greenish or bluish tint in aggregates and

* E-mail: ernst.burke@falw.vu.nl

† E-mail: giovanni.ferraris@unito.it

larger crystals; vitreous in crystals and silky in aggregates; transparent
 Biaxial (+), α 1.6348, β 1.6495, γ 1.6686, $2V_z$ (calc.) 83.4°
 6.24(34), 3.230(22), 3.130(37), 3.038(40), 2.690(100), 1.668(22)

IMA No. 2003-006

New structure type

Trigonal: *P* $\bar{3}$ *a* 7.6014, *c* 9.2195 Å

Steel-gray to black; submetallic to dull; opaque

In reflected light: gray with weak brownish tint; no internal reflections; weak bireflectance, pleochroism and anisotropy. R_{\min} and R_{\max} (air): 15.9–16.8 (470 nm), 16.0–17.3 (546 nm), 15.9–17.4 (589 nm), 16.1–17.7 (650 nm)
 9.22(53), 3.100(70), 2.785(100), 2.679(62), 2.402(48), 2.190(97), 1.934(75)

IMA No. 2003-007(Ca,Fe,Th)(REE,Ca)(Al,Cr,Ti)₂(Mg,Fe,Al)Si₃O₁₂(OH,F) with La > Ce

Epidote group

Structure determined

Monoclinic: *P*₂*1*/*m**a* 8.9616, *b* 5.7265, *c* 10.2353 Å, β 115.193°

Black, very dark brown; vitreous; opaque

Biaxial (+), α 1.7395, β 1.7434, γ 1.7495, $2V_\gamma$ (meas.) 77.0° , $2V_\gamma$ (calc.) 77.5°
 3.53(49), 2.926(100), 2.860(53), 2.714(41), 2.699(44), 2.623(38), 2.553(51)

IMA No. 2003-008(Na,Sr,K,Ca)₇(Ti,Nb)₈[Si₄O₁₂]₄(O,OH)₈ $\cdot n$ H₂O $n \sim 8$

Labuntsovite group

Structure determined

Monoclinic: *C*2/*m**a* 14.596, *b* 14.249, *c* 15.852 Å, β 117.27(10)°

Colorless; vitreous; transparent

Biaxial (+), α 1.657, β 1.666, γ 1.765, $2V$ (meas.) $19\text{--}31^\circ$, $2V$ (calc.) 35°
 7.09(100), 3.24(90), 3.15(80), 3.11(80), 2.54(70), 2.491(70)

IMA No. 2003-009

New structure type

Trigonal: *P* $\bar{3}$ *a* 10.824, *c* 7.549 Å

Canary-yellow to orange-yellow; vitreous; translucent

Uniaxial (+), ω 1.815, ϵ 1.910

4.60(100), 2.90(80), 1.87(30), 1.747(30), 1.211(30)

IMA No. 2003-010

Zn-dominant analogue of libethenite

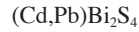
Structure determined

Orthorhombic: *P**n**n**m**a* 8.3263, *b* 8.2601, *c* 5.8771 Å

Bright-green with a bluish tint; vitreous; translucent

Biaxial (–), α 1.660, β 1.705, γ 1.715

5.87(39), 4.79(100), 3.699(22), 2.935(33), 2.632(47), 2.405(19), 2.304(18)

IMA No. 2003-011

Pavonite homologous series

Structure determined

Monoclinic: *C*2/*m**a* 13.096, *b* 4.004, *c* 14.717 Å, β 115.602(5)°

Dark gray (reddish); metallic; opaque

In reflected light: white, no internal reflections, distinct bireflectance, strong anisotropy

R_{\min} and R_{\max} (air): 29.6–36.4 (470 nm), 32.4–38.8 (546 nm), 31.8–38.2 (589 nm), 31.4–37.7 (650 nm)
 3.689(97), 3.648(84), 3.508(81), 3.109(38), 2.935(100), 2.804(93), 2.338(43)

IMA No. 2003-012

New structure type

Orthorhombic: *P**n**m**a**a* 9.455, *b* 5.866, *c* 8.668 Å

Blue; vitreous; translucent

Biaxial (–), α 1.627, β 1.699, γ 1.769, $2V$ (calc.) 86°

4.73(100), 3.941(90), 3.192(40), 2.545(45), 2.489(50), 1.838(40), 1.712(40)

IMA No. 2003-013

Eudialyte group

Structure determined

Trigonal: *R*3*m**a* 14.262, *c* 29.949 Å

Yellow-green (different shades); vitreous; transparent or translucent

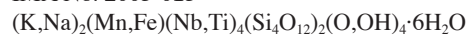
Uniaxial (–), ω 1.639, ϵ 1.631

6.42(54), 4.30(62), 3.202(100), 3.155(71), 2.975(98), 2.857(94), 2.591(54)

IMA No. 2003-014Cubic: *P**m* $\bar{3}$ *m**a* 2.831 ÅNo macroscopic data (grains up to 35 μ m)

In reflected light: yellowish-white, isotropic. R: 47.1 (470 nm), 48.8 (546 nm), 50.0 (589 nm), 50.9 (650 nm)

2.831, 2.000, 1.631, 1.415, 1.267, 1.157, 1.000 (no intensities given)

IMA No. 2003-015

Labuntsovite group

Structure determined

Monoclinic: *C*2/*m**a* 14.563, *b* 13.961, *c* 7.851(2) Å, β 117.62°

Orange-yellow to brownish; vitreous; translucent to transparent

Biaxial (+), α 1.670, β 1.685, γ 1.775(5), $2V(\text{meas.})$ 52°, $2V(\text{calc.})$ 46°
6.96(100), 6.40(20), 4.94(80), 3.22(90), 3.10(80), 2.510(40)

IMA No. 2003-016

$(\text{Hg}_2)_{10}^{2+}\text{O}_6\text{I}_3(\text{Br}_{1.6}\text{Cl}_{1.4})_{\Sigma 3.0}[(\text{CO}_3)_{0.8}\text{S}_{0.2}^{2-}]_{\Sigma 1.0}$

Structure determined

Triclinic: $P\bar{1}$

a 9.344, b 10.653, c 18.265 Å, α 93.262, β 90.548, γ 115.422°

Silvery gray to black to dark red-black; adamantine to metallic; translucent to opaque

In reflected light: gray; abundant, orange-red to blood-red internal reflections; no birefractance, no pleochroism; moderate to strong anisotropy. R_{\min} and R_{\max} (air): 28.6–29.5 (470 nm), 26.2–27.1 (546 nm), 24.6–25.7 (589 nm), 22.8–24.0 (650 nm)
7.64(60), 4.20(80), 3.296(50), 3.132(90), 2.894(100), 2.722(80), 2.629(50)

IMA No. 2003-017

$(\text{REE,Ca})_4(\text{Fe}^{3+}, \text{Ti}, \text{Fe}^{2+}, \square)(\text{Ti}, \text{Fe}^{3+}, \text{Fe}^{2+}, \text{Nb})_4\text{Si}_4\text{O}_{22}$

Fe-dominant analogue of polyakovite-(Ce)

Structure determined

Monoclinic: $C2/m$

a 13.385, b 5.742, c 11.059 Å, β 100.60°

Black or brown-black; submetallic pitchy; opaque

Biaxial (–), α 1.937, β not determined, γ 1.970

In reflected light: gray; yellowish-gray internal reflections; weak birefractance and pleochroism; strong anisotropy. R_{\min} and R_{\max} (air): 12.5–14.6 (470 nm), 12.1–14.4 (546 nm), 12.1–14.3 (589 nm), 11.2–13.7 (650 nm)
4.89(35), 3.490(40), 3.189(80), 3.004(40), 2.874(40), 2.760(40), 2.722(100)

IMA No. 2003-018

$\text{Na}_{5.5}\text{Mn}_{0.25}\text{ZrSi}_6\text{O}_{16}(\text{OH})_2$

Lovozerite group

Structure determined

Monoclinic: $C2/m$

a 10.693, b 10.299, c 7.373(4) Å, β 91.91°

Dark cherry-colored; vitreous; transparent

Biaxial (–), some grains are uniaxial (–); α 1.585, $\beta \approx \gamma$ 1.589, $2V(\text{meas.}) < 5^\circ$, $2V(\text{calc.}) -0^\circ$
7.40(36), 5.31(51), 3.690(43), 3.342(84), 3.270(92), 2.652(100), 2.580(91), 1.849(39)

IMA No. 2003-019

$\text{Na}_6\text{Sr}_{12}\text{Ba}_2\text{Zr}_{13}\text{Si}_{39}\text{B}_4\text{O}_{123}(\text{OH})_6 \cdot 20\text{H}_2\text{O}$

Related to benitoite

Structure determined

Hexagonal: $P6_3cm$

a 26.509, c 9.975 Å

Colorless to gray; vitreous; translucent

Uniaxial (+), ω 1.640, ϵ 1.663
5.76(40), 3.924(30), 3.761(90), 3.310(25), 3.150(50), 2.760(100), 1.991(70)

IMA No. 2003-020

Cu_6GeWS_8

Hexagonal: $P6_3/mmc$, $P\bar{6}2c$ or $P6_3mc$

a 7.523, c 12.384 Å

Gray; metallic; opaque

In reflected light: grayish white with a distinct brownish tint; red internal reflections; no pleochroism, weak birefractance; weak anisotropy. R_{\min} and R_{\max} (air): 24.5–25.2 (470 nm), 24.1–24.5 (546 nm), 24.5–25.1 (589 nm), 23.4–23.7 (650 nm)
6.18(40), 5.78(100), 3.153(40), 2.887(40), 2.417(40), 1.971(50), 1.881(80), 1.744(50)

IMA No. 2003-021

$\text{Cu}_2\text{Mg}_2(\text{Mg,Cu})(\text{OH})_4(\text{H}_2\text{O})_4(\text{AsO}_4)_2$

Isotypic with akrochordite

Structure determined

Monoclinic: $P2_1/c$

a 5.475, b 16.865, c 6.915 Å, β 99.80°

Blue; vitreous; transparent

Biaxial (–), α 1.664, β 1.691, γ 1.695, $2V(\text{meas.})$ 31°, $2V(\text{calc.})$ 42°

8.42(100), 4.32(21), 4.21(64), 3.016(12), 2.907(10), 2.809(7)

IMA No. 2003-022

$\text{Cs}(\text{Be}_2\text{Li})\text{Al}_2\text{Si}_6\text{O}_{18}$

Beryl group

Structure determined

Hexagonal: $R3c$

a 15.946, c 27.803 Å

Raspberry red to pink; vitreous; translucent to transparent

Uniaxial (–), ω 1.616, ϵ 1.608

3.271(100), 3.027(41), 3.019(29), 2.871(52), 2.229(12), 2.215(14), 1.636(14)

IMA No. 2003-024

$(\text{Zr,Mn})_2(\text{Zr,Ti})(\text{Mn,Na})(\text{Na,Ca})_4(\text{Si}_2\text{O}_7)_2(\text{O,F})_4$

Seidozerite group

Structure determined

Monoclinic: $P2/c$

a 5.6082, b 7.1387, c 18.575 Å, β 102.60°

Yellowish brown to dark brown; vitreous; translucent

Biaxial, birefringence on (001) is 0.041: α 1.694, γ_1 1.735, $2V > 90^\circ$

3.949(15), 3.027(68), 2.898(100), 2.613(26), 2.459(24), 1.853(24), 1.786(14), 1.650(14)

IMA No. 2003-025

$\text{Th}_{0.5}(\text{UO}_2)_2\text{Si}_5\text{O}_{13} \cdot 3\text{H}_2\text{O}$

Isostructural with weeksite

Orthorhombic: $Cmmb$

a 14.1676, b 14.1935, c 35.754 Å

Yellow; waxy to silky; transparent to translucent

Biaxial (–), α 1.620, β 1.627, γ 1.629, $2V(\text{meas.})$ 40°, $2V(\text{calc.})$ 56.1°

7.06(100), 5.56(59), 4.58(47), 3.528(86), 3.287(57), 3.188(73), 2.981(46), 2.904(78)

IMA No. 2003-026

$(\text{Cu},\square)_6(\text{Pb,Bi})\text{Se}_4$

Structure determined

Monoclinic: $P2_1/m$

a 9.5341, b 4.1004, c 10.2546 Å, β 100.066°

Black; metallic; opaque

In reflected light: gray, no internal reflections, no pleochroism, very weak bireflectance, very weak anisotropism. R_{\min} and R_{\max} (air): 36.6–38.1 (470 nm), 36.45–38.1 (546 nm), 36.6–38.3 (589 nm), 36.6–38.5 (650 nm)
3.189(100), 3.132(100), 2.601(70), 2.505(50), 2.151(60), 2.058(80), 1.909(50)

IMA No. **2003-027**

$\text{Pb}_{21}\text{SnAs}_{11}\text{Bi}_{11}\text{S}_{50}\text{Cl}_8\text{Se}$

Structure determined

Orthorhombic: $F2mm$

a 45.824, b 8.368, c 53.990 Å

Silvery gray; metallic; opaque

In reflected light: white, no internal reflections, no pleochroism, no bireflectance, weak anisotropism. R (air): 34.25 (470 nm), 32.95 (546 nm), 32.60 (589 nm), 31.05 (650 nm)
3.34(80), 3.17(60), 2.85(80), 2.69(80), 2.17(60), 2.10(70), 2.07(100), 2.04(50)

IMA No. **2003-028**

(La,Ce)OF

Structure determined

Cubic: $Fm\bar{3}m$

a 5.628 Å

Light yellow; powdery; translucent

Isotropic, $n = 1.85$

3.252(100), 2.815(26), 1.991(56), 1.6969(39)

IMA No. **2003-029**

$\text{Mn}(\text{C}_2\text{O}_4) \cdot 2\text{H}_2\text{O}$

Mn analogue of humboldtine (oxalate)

Monoclinic: $C2/c$

a 11.955, b 5.632, c 9.967 Å, β 128.34°

White to grayish white; vitreous; transparent

Biaxial (–), α 1.424, β 1.550, γ 1.65, $2V(\text{meas.})$ 80°, $2V(\text{calc.})$ 77°

4.85(26), 4.80(100), 4.70(84), 3.91(23), 3.62(22), 2.996(58)

IMA No. **2003-030**

$\text{CeCu}_6(\text{AsO}_4)_3(\text{OH})_6 \cdot 3\text{H}_2\text{O}$

Mixite group

Hexagonal: $P6_3/m$

a 13.59, c 5.89 Å

Green to yellowish green; vitreous, in part silky; translucent to transparent

Uniaxial (+), ω 1.725, ϵ 1.810

11.88(10), 4.47(8), 3.56(8), 2.95(8), 2.70(5), 2.57(5), 2.46(9)

IMA No. **2003-032**

Tl(Cl,Br)

Sal ammoniac group

Structure determined

Cubic: $Pm\bar{3}m$

a 3.8756 Å

Gray-brown; resinous to greasy; translucent

Isotropic, n (calc.) 2.015

3.887(80), 2.745(100), 2.237(55), 1.937(50), 1.733(45), 1.583(70)

IMA No. **2003-033**

$\text{NaFe}_3(\text{Mg,Mn})(\text{AsO}_4)_3 \cdot \text{H}_2\text{O}$

Alluaudite group

Structure determined

Monoclinic: $C2/c$

a 12.181, b 12.807, c 6.6391 Å, β 112.441°

Brown to brown-black; adamantine; translucent

Biaxial (–), α 1.870, β 1.897, γ 1.900, $2V(\text{meas.})$ 35°, $2V(\text{calc.})$ 36.5°

6.40(20), 5.63(20), 3.575(30), 3.202(40), 2.917(35), 2.768(100), 2.611(40)

IMA No. **2003-034**

$\text{Cs}_4\text{Na}_2\text{Zr}_3(\text{Si}_{18}\text{O}_{45})(\text{H}_2\text{O})_2$

Phyllosilicate

New structure type

Monoclinic: $C2/c$

a 26.3511, b 7.5464, c 22.9769, β 107.237°

Colorless; vitreous; transparent

Biaxial (–), α 1.585, β 1.598, γ 1.603, $2V(\text{calc.})$ 63°

6.32(50), 3.65(50), 3.35(100), 3.14(90), 2.82(50), 2.62(70)

IMA No. **2003-035**

$\text{SrB}_2\text{Si}_2\text{O}_8$

Sr-dominant analogue of danburite

Structure determined

Orthorhombic: $Pnma$

a 8.155, b 7.919, c 8.921 Å

Colorless; vitreous; transparent

Biaxial (–), α 1.597, β 1.627, γ 1.632, $2V(\text{meas.})$ 43°, $2V(\text{calc.})$ 44°

5.94(60), 3.62(100), 3.51(90), 3.31(80), 3.01(60), 2.786(90), 2.706(60), 1.982(70)

IMA No. **2003-036**

$\text{Ba}_2\text{Mn}(\text{VO}_4)_2(\text{OH})$

Mn-dominant analogue of gamagarite

Monoclinic: $P2_1/m$

a 9.10, b 6.13, c 7.89, β 112.2°

Black-red; vitreous; translucent

Biaxial, n (calc.) 2.03

3.46(26), 3.31(100), 3.00(16), 2.90(19), 2.80(62), 2.71(40), 2.16(18)

IMA No. **2003-037**

$\text{Ce}_2\text{Fe}^{2+}[\text{Si}_2\text{O}_7](\text{CO}_3)$

New structure type

Monoclinic: $P2_1/c$

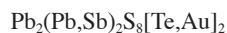
a 6.512, b 6.744, c 18.94(4) Å, β 111.90°

Brown; vitreous; translucent

Biaxial (–), α 1.785, β 1.810, γ 1.820, $2V(\text{meas.})$ 66°, $2V(\text{calc.})$ 64°

4.41(4), 3.61(4), 3.30(5), 2.92(10), 2.65(5), 2.23(5)

IMA No. **2003-039**



Nagyágite-buckhornite homologous series

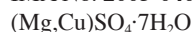
Monoclinic: $P2_1/m$

a 4.361, b 6.618, c 20.858 Å, β 92.71°

Dark silver-gray; metallic; opaque

In reflected light: gray color, very low bireflectance and pleochroism, distinct anisotropy. $R(\text{air})$: 38.4–40.3 (471 nm), 38.1–40.1 (548 nm), 37.5–39.4 (587 nm), 35.9–38.0 (652 nm) 6.93(38), 4.80(52), 4.10(40), 3.56(100), 3.47(58), 3.31(40), 2.99(50), 2.98(30), 2.56(41)

IMA No. 2003-040



Melanterite group

Structure determined

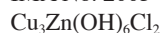
Monoclinic: $P2_1/c$

a 14.166, b 6.534, c 10.838 Å, β 105.922°

Blue; vitreous; transparent

Biaxial (+), α 1.462, β 1.465, γ 1.469, $2V(\text{meas.})$ 79.8°, $2V(\text{calc.})$ 82° 4.85(100), 4.79(14), 4.44(16), 3.779(38), 3.663(15), 3.254(15), 3.078(14), 2.721(14)

IMA No. 2003-041



Related to paratacamite

Structure determined

Trigonal: $R\bar{3}m$

a 6.834, c 14.075 Å

Dark-green to blue-green; vitreous; transparent

Uniaxial (–), ω 1.825, ϵ 1.815 5.47(55), 4.70(14), 2.899(11), 2.764(100), 2.730(13), 2.266(36), 1.820(13), 1.709(18)

IMA No. 2003-042



Linnaeite group

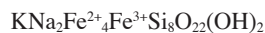
Cubic: $Fd\bar{3}m$

a 10.81 Å

Black; adamantine; translucent

In reflected light: gray color, isotropic, brown-red internal reflections. $R(\text{air})$: 23.9 (470 nm), 21.6 (546 nm), 20.8 (589 nm), 20.2 (650 nm) 3.87(4), 3.27(10), 2.70(6), 2.07(8), 1.91(9), 1.41(6), 1.246(7), 1.107(9), 1.045(8)

IMA No. 2003-043



Amphibole group

Structure determined

Monoclinic: $C2/m$

a 10.002 b 18.054 c 5.319(1) Å, β 103.90(3)°

Black or dark blue-green; vitreous; translucent to transparent

Biaxial (–), α 1.683, β 1.692, γ 1.699, $2V(\text{meas.}) > 60^\circ$, $2V(\text{calc.}) 82^\circ$ 9.02(28), 8.53(100), 3.419(12), 3.303(23), 3.184(40), 2.847(17), 2.725(10)

IMA No. 2003-044



Heterophyllosilicate

Structure determined

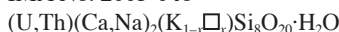
Monoclinic: $I11b$

a 5.552, b 7.179, c 50.94(1) Å, γ 91.10°

Creamy or pale yellow; silky; semi-transparent

Biaxial (+), α 1.668, β 1.679, γ 1.710, $2V(\text{meas.}) 63^\circ$, $2V(\text{calc.}) 63^\circ$ 25.50(100), 12.68(14), 8.48(72), 5.11(11), 3.44(14), 3.17(74), 2.763(20), 2.110(14)

IMA No. 2003-046



Steacyite group

Structure determined

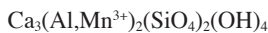
Tetragonal: $P4/mcc$

a 7.6506, c 14.9318 Å

Dark-green; vitreous; transparent

Uniaxial (–), ω 1.615, ϵ 1.610 5.34(23), 5.28(38), 3.37(100), 3.31(59), 2.640(64), 2.515(21), 2.161(45), 2.016(29), 1.644(30)

IMA No. 2003-047



Garnet group

Structure determined

Tetragonal: $I4_1/acd$

a 12.337, c 11.930 Å

Brownish yellow; vitreous; transparent

Uniaxial (+), ω 1.718, ϵ 1.746 3.08(44), 2.978(45), 2.757(55), 2.743(100), 2.685(54), 2.501(47), 1.614(56)

IMA No. 2003-048



Schertelite-struvite group

Structure determined

Orthorhombic: $Pmn2_1$

a 6.892, b 6.166, c 11.139 Å

Colorless; vitreous; transparent

Biaxial (+), α 1.490(2), β 1.493(2), γ not determined, $2V_z$ (meas.) large 4.26(100), 4.14(80), 3.27(90), 2.905(50), 2.699(50), 2.650(70), 1.954(50)

IMA No. 2003-049



CsCl structure

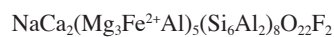
Cubic: $Pm\bar{3}m$

a 3.0014 Å

Steel-gray with a bronze tint; metallic; opaque

In reflected light: creamy to bright white, isotropic, no internal reflections. $R(\text{air})$: 58.7 (470 nm), 62.6 (546 nm), 64.1 (589 nm), 65.3 (650 nm) 2.122(100), 1.500 (30), 1.225(70), 1.061(40), 0.9491(50), 0.8021(60)

IMA No. 2003-050



Amphibole group

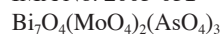
Structure determined

Monoclinic: $C2/m$ a 9.8771, b 18.041, c 5.3092 Å, β 105.133°

Black; vitreous; transparent to translucent in very thin fragments

Biaxial (+), α 1.634, β 1.642, γ 1.654, $2V(\text{meas.})$ 68°, $2V(\text{calc.})$ 79°

8.42(100), 3.28(20), 3.21(84), 3.00(13), 2.825(54), 2.379(17), 2.347(15), 1.443(15)

IMA No. **2003-051**

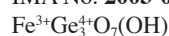
New structure type

Orthorhombic: $Pnca$ a 5.303, b 16.169, c 23.980 Å

Yellow; adamantine; transparent

Biaxial (-), α 2.22, β 2.255, γ 2.26, $2V(\text{meas.})$ 42°, $2V(\text{calc.})$ 41°

3.41(37), 2.996(69), 2.963(48), 2.688(100), 2.001(28), 1.887(13), 1.657(14)

IMA No. **2003-052**Orthorhombic: P^{***} a 8.302, b 9.718, c 4.527 Å

Dirty brown-green; vitreous; opaque in aggregates, transparent in crystals

Biaxial (+), with at least two indices of refraction greater than 1.8, $2V(\text{meas.})$ large

4.11(40), 3.68(100), 3.12(60), 2.921(100), 2.512(40), 2.403(90), 1.646(80), 1.624(50)

IMA No. **2003-053**

Dimorphous with formanite

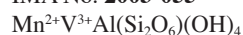
Structure determined

Monoclinic: $P2/a$ a 5.262, b 5.451, c 5.110 Å, β 95.12°

Amber brown to brown; vitreous to adamantine; translucent

 $R(\text{air})$: 13.8–14.1 (470 nm), 13.6–13.8 (546 nm), 13.6–13.9 (589 nm), 13.7–14.0 (650 nm)

3.13(100), 2.95(94), 2.73(26), 2.62(23), 1.890(29), 1.862(29), 1.614(20)

IMA No. **2003-055**

Crapholite group

Structure determined

Orthorhombic: $Ccca$ a 13.830, b 20.681, c 5.188 Å

Pale straw-yellow to brown; vitreous to silky; transparent

Biaxial (+), α 1.684, β 1.691 (calc.), γ 1.700, $2V(\text{meas.})$ 85°
5.75(100), 5.15(18), 4.72(14), 3.46(15), 3.08(22), 2.641(26)IMA No. **2003-056**

Ullmannite group

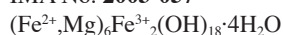
Structure determined

Cubic: $P2_1/3$ a 6.3181 Å

Silver-gray; metallic; opaque

In reflected light: white, isotropic, no internal reflections. $R(\text{air})$: 48.6 (470 nm), 47.5 (546 nm), 47.6 (589 nm), 49.0 (650 nm)

3.16(53), 2.825(100), 2.579(81), 2.233(32), 1.905(98), 1.752(27), 1.688(25), 1.379(18)

IMA No. **2003-057**

Meixnerite group

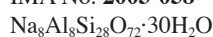
Structure determined

Trigonal: $R\bar{3}m$ a 3.125, $c \sim 22.5$ Å

Bluish-gray; earthy

No optical data

7.97(100), 3.97(32), 2.692(34), 2.027(19), 1.595(9), 1.563(10)

IMA No. **2003-058**

Zeolite group

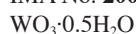
Structure determined

Hexagonal: $P6_3/mmc$ a 18.235, c 7.636 Å

Colorless, white; vitreous; transparent

Uniaxial (+), ω 1.471, ϵ 1.472

9.08(100), 6.86(70), 5.95(70), 4.68(40), 3.79(80), 3.51(40), 3.15(70)

IMA No. **2003-059**

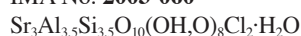
Related to ferritungstite

Cubic: $Fd\bar{3}m$ a 10.203 Å

White; vitreous; translucent

Isotropic, n 2.240

5.88(100), 3.08(62), 2.944(78), 2.551(12), 1.964(17), 1.804(23), 1.725(14), 1.538(14)

IMA No. **2003-060**

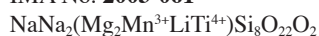
New structure type

Monoclinic: $P2/m$, $P2$, or Pm a 5.893, b 7.262, c 10.288 Å, β 97.23°

White; silky; translucent

Biaxial (+), α 1.639, β 1.648, γ 1.665, $2V(\text{meas.})$ 75°, $2V(\text{calc.})$ 72.7°

10.13(100), 3.23(80), 2.96(100), 2.90(100), 2.505(100), 2.182(80), 2.104(60), 1.855(70)

IMA No. **2003-061**

Amphibole group

Structure determined

Monoclinic: $C2/m$ a 9.808, b 17.840, c 5.2848 Å, β 104.653°

Pink-red; vitreous; transparent

Biaxial (+), α 1.688, β 1.692, γ 1.721. $2V(\text{meas.})$ 49°, $2V$

(calc.) 41°
4.45(6), 3.38(7), 3.13(8), 2.697(10), 2.542(9), 2.154(7),
1.434(7)

IMA No. 2003-062

$\text{Na}(\text{CaMn})_{22}\text{Mg}_5(\text{Si}_7\text{Al})\text{O}_{22}(\text{OH})_2$

Amphibole group

Structure determined

Monoclinic: $C2/m$

a 9.795, b 18.047, c 5.287 Å, β 104.28°

Very pale pinkish-brown; vitreous; translucent

Biaxial (–), α 1.620, β 1.632, γ 1.642, $2V$ (calc.) 84°

10.53(50), 3.39(59), 3.27(48), 3.12(61), 2.948(47), 2.720(46),

2.711(100), 2.594(49)

IMA No. 2003-063

$\square\text{NaFe}^{2+}\text{Fe}^{3+}\text{Al}(\text{PO}_4)_3$

Wyllieite group

Structure determined

Monoclinic: $P2_1/n$

a 11.838, b 12.347, c 6.2973 Å, β 114.353°

Dark-green to bronze; resinous; transparent

Biaxial (–), α 1.730, β 1.758, γ 1.775, $2V$ (meas.) 82°, $2V$ (calc.)

75°

8.10(30), 6.17(50), 5.38(40), 4.05(45), 3.45(65), 3.01(40),

2.693(75), 2.677(100)

IMA No. 2003-064

$\text{Cu}_2\text{AgPbBiS}_4$

Higher homologue of miharaite

Structure determined

Monoclinic: $P2_1/n$

a 4.0329, b 12.734, c 14.639 Å, β 90.103°

Gray; metallic; opaque

In reflected light: yellowish-brownish, moderate birefractance,
distinct anisotropy, no internal reflections. R (air): 40.2–45.7
(470 nm), 39.3–44.5 (546 nm), 38.9–44.1 (589 nm), 38.6–44.1
(650 nm)

3.67(100), 3.66(64), 3.41(60), 3.319(62), 3.317(62), 3.111(69),

3.022(72), 3.017(72)

IMA No. 2003-065

$\text{Ca}(\text{REE,Ca})\text{Al}_2(\text{Fe}^{2+},\text{Fe}^{3+})(\text{SiO}_4)(\text{Si}_2\text{O}_7)\text{O}(\text{OH})$

Epidote group

Structure determined

Monoclinic: $P2_1/m$

a 8.914, b 5.726, c 10.132 Å, β 114.87°

Black; vitreous; transparent to translucent

Biaxial, α' 1.755, β 1.760, γ' 1.765, $2V$ not determined 7.93(15),

3.51(20), 2.901(100), 2.860(40), 2.692(60), 2.611(50), 2.283(15),

2.174(25)

IMA No. 2003-066

Parvowinchite $\text{Na}(\text{NaMn})_{22}(\text{Mg}_4\text{Fe}^{3+})_{25}\text{Si}_8\text{O}_{22}(\text{OH})_2$

Amphibole group

Structure determined

Monoclinic: $C2/m$

a 9.704, b 17.990, c 5.297 Å, β 103.51°

Straw-yellow; vitreous; translucent

Mean index of refraction (n) 1.665 (calc.)

8.36(76), 3.40(62), 3.26(34), 3.10(66), 2.714(100), 2.591(35),

2.522(61), 2.166(36)

Exceptionally, the name of this new mineral is published here, on request of the author (Roberta Oberti of Pavia, Italy). Similar amphibole material has been previously described as “tirodite”, but this name was discredited in the 1997 paper on amphibole nomenclature, the new name being “(alkali-bearing) manganocummingtonite”. The new name “parvowinchite” has already been attributed in the Leake et al. (2003) amphibole paper (Canadian Mineralogist, 41, 1355–1362) to the specimen described by Oberti and Ghose (1993, European Journal of Mineralogy, 5, 1153–1160). Because further characterization of the available material is not possible, no further report will be published.

OLDER PROPOSALS**IMA No. 95-020c**

$\text{CaB}_3\text{O}_4(\text{OH})_3$

New structure type

Monoclinic: $P2_1/a$

a 8.386, b 8.142, c 7.249 Å, β 98.33°

White to colorless; vitreous; translucent to transparent

Biaxial (+), α 1.573, β 1.586, γ 1.626, $2V$ (meas.) 60°, $2V$ (calc.)

61°

4.32(57), 3.39(100), 3.13(50), 2.93(23), 2.606(25), 2.360(17),

2.287(19), 1.849(25)

IMA No. 2000-043a

$(\text{Al,Ga})_2(\text{Ge,C})\text{O}_4(\text{OH})_2$

Isotypic with topaz

Structure determined

Orthorhombic: $Pnma$

a 9.1111, b 8.5276, c 4.8064 Å

Beige to white; greasy; translucent

Biaxial, n (calc.) = 1.757

3.811(78), 3.315(48), 3.016(100), 2.464(24), 2.417(27),

2.247(38), 1.398(29)

IMA No. 2001-067a

$^A\square^B(\text{Na}_1\text{Li}_1)^C(\text{Fe}_3^+\text{Mg}_3)^T\text{Si}_8\text{O}_{22}(\text{OH})_2$

Amphibole group

Structure determined

Monoclinic: $C2/m$

a 9.535, b 17.876, c 5.234 Å, β 102.54°

Black; vitreous; translucent

Biaxial, no other optical properties given

8.27(15), 3.408(18), 3.058(36), 2.710(100), 2.501(68), 1.581(19),

1.399(20)

IMA No. 2002-009a

$\text{Ca}_2\text{Fe}_4^+\text{Fe}^{3+}\text{TiSi}_4\text{BeAlO}_{20}$

Aenigmatite group

Structure determined

Triclinic: $P\bar{1}$

a 10.3549, b 10.7508, c 8.8732 Å, α 105.707, β 96.227, γ

124.861°

Black; vitreous; opaque.

Biaxial (sign not known), α 1.799, β -, γ 1.86, $2V$ not known
8.00(57), 4.78(29), 3.12(32), 2.924(69), 2.676(77), 2.530(100),
2.410(28), 2.075(39)

OTHER NOMENCLATURE DECISIONS

IMA No. 03-A

It has been approved that the general CNMMN advocacy of Schaller modifiers [Hey and Gottardi, *Canadian Mineralogist*, 18 (1980), 261–262; Nickel and Mandarino, *Canadian Mineralogist*, 25 (1987), 353–377] is to be dropped. When it is desired to indicate the presence of subordinate chemical components in a mineral, Schaller modifiers may be used in unambiguous cases, namely those in which the element has two, and only two, valence states. In the more general case, adjectival modifiers such as “-bearing” or “-rich” should be used, together with the specified element(s), and with the numerical oxidation state, if required, e.g., “Mn⁽²⁺⁾-rich,” “V(III)-deficient,” “Mg-bearing,” etc.

IMA No. 03-B

Spodiosite discredited: Spodiosite is a mixture of fluorapatite, calcite and serpentine.

IMA No. 03-C

Naming polytypes of wagnerite: The known polytypes of wagnerite, ideally Mg₂(PO₄)F, are named wagnerite-*Ma2bc* (space group *P2₁/c*), wagnerite-*Ma5bc* (space group *Ia*), wagnerite-*Ma7bc* (space group *P2₁*), and wagnerite-*Ma9bc* (space group *Ia*). Polytypes of zwiesselite and triplite can be written in analogy with those of wagnerite.

Magniotriplite discredited: Magniotriplite and wagnerite are polytypes, not polymorphs, of one another. The name wagnerite has priority (1821 vs. 1951 for magniotriplite), therefore the species and name *magniotriplite* is discredited.

Nomenclature of a mineral group

Amphiboles: additions and revisions to the International Mineralogical Association’s amphibole nomenclature.

See *Canadian Mineralogist*, 41 (2003), 1355–1362, *European Journal of Mineralogy*, 16 (2004), 191–196, and other journals, and also on the CNMMN website (www.geo.vu.nl/~ima-cnmmn).

IMA No. 2003-058

Mazzite renamed mazzite-Mg: the approval of IMA No. 2003-058 as a new mineral automatically implies that the name of the existing mazzite is changed to mazzite-Mg, and that these two minerals form the new mazzite series within the zeolites.

Withdrawal of an approved mineral

Prassoite: the mineral prassoite, Rh₃S₄, was approved as mineral 70-041 by the CNMMN in March 1971. The author, Kingston, published some data in his Ph.D. thesis in 1977. These data were summarized by Cabri in 1981, but he stated that the

true formula might be Rh₁₇S₁₅. Augé found the same mineral as Kingston in 1988, with the formula Rh₃S₄ (*Canadian Mineralogist*, 26, 177–192), and this paper was mentioned by Jambor in 1989 (*American Mineralogist*, 74, 1220).

Britvin et al. proposed the mineral miassite (97-029) to the CNMMN with the formula Rh₁₇S₁₅. This mineral was approved in October 1997, but the name was suspended because of possible problems with prassoite. The authors were asked to contact Kingston. They tried to do so, but to no avail.

After having heard from Britvin et al. that Kingston did not reply to any search, the suspension on the name miassite was lifted, but the CNMMN chairman then made a mistake (probably by not having access to the 1971 archives). In his Memorandum of July 1999, Joel Grice wrote: “Prassoite” was never approved by the CNMMN, and no type material can be found. It is apparent that the authors of miassite have done everything possible to establish or refute the existence of this dubious mineral and the name “prassoite” is to be discouraged from further usage. In his letter to Britvin et al., lifting the suspension, Joel Grice wrote: I would ask you to make it clear in your publication that all attempts were made to find the type material for a formal discreditation of prassoite but none existed.

Britvin et al. published their miassite in *ZVMO* 130(2), 41–44 (2001), stating in the paper that prassoite was never approved by the CNMMN, this, of course, on the authority of Joel Grice. The paper was abstracted by Jambor (*American Mineralogist*, 87, p. 1511), with the correction that prassoite had indeed been approved by the CNMMN back in 1971.

Later, it became apparent that the type material of prassoite was present in the British Museum (on the same specimen as the type material for kingstonite), but the letters of Britvin et al. to Kingston were never forwarded to the curator of the British Museum.

We have, meanwhile, the strange fact that there are at least ten papers using the name prassoite (the most recent one in *Canadian Mineralogist*, 40 (2002), 1127–1146), but only a single paper on miassite! Moreover, the name “prassoite” has never been officially discredited or withdrawn.

In view of the delay in the (incomplete) publication of the inadequately described prassoite and the uncertainties about its composition, **the name “prassoite” is withdrawn for the time being in favor of miassite.** Unambiguous evidence for the existence of Rh₃S₄ as a mineral might reinstate the name prassoite.

Recommendations on CNMMN procedures

On request and proposal of Donald Peacor the following recommendations on CNMMN procedures have been approved in 1999/2000, but never published until now:

- Mineral status should be accorded to those materials occurring in sub-micrometer-sized crystallites only if they are of sufficient total volume or concentration to be detected by at least one commonly used laboratory technique.
- CNMMN criteria for approval of mineral species status should be viewed as flexible guidelines.