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**NEW MINERALS AND NOMENCLATURE MODIFICATIONS APPROVED
IN 2003 BY THE COMMISSION ON NEW MINERALS AND MINERAL NAMES,
INTERNATIONAL MINERALOGICAL ASSOCIATION**

ERNST A.J. BURKE[§]

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

GIOVANNI FERRARIS[¶]

Dipartimento 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 (CNMMN), International Mineralogical Association (IMA), for comparative purposes and as a service to mineralogists working on new species. Each mineral is described in the following format:

IMA Number
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 [*d* in Å(*l*)]

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

The 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

The Ba-dominant analogue of olgite Structure determined

Trigonal: *P3*

a 5.549, *c* 7.032(2) Å

Light green; vitreous; transparent

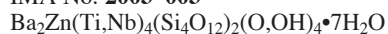
Uniaxial (-), ω 1.628, ε 1.623

7.04(22), 3.964(60), 2.839(100), 2.774(100), 2.344(20),

1.984(40), 1.611(26)

[§] Chairman, Commission on New Minerals and Mineral Names (CNMMN). *E-mail address*: ernst.burke@falw.vu.nl

[¶] Vice-Chairman, CNMMN. *E-mail address*: giovanni.ferraris@unito.it

IMA No. **2003-003**

Labuntsovite group,

kuzmenkoite subgroup

Structure determined

Monoclinic: *Cm*

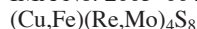
$$a\ 14.381, b\ 13.889, c\ 7.793(2)\ \text{\AA}, \beta\ 117.52^\circ$$

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

Biaxial (+), α 1.683, β 1.692, γ 1.795; $2V$ (meas.) 30, $2V$ (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**Cubic: *F* $\bar{4}3m$

$$a\ 9.563\ \text{\AA}$$

Black; metallic; opaque

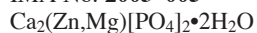
In reflected light: bluish green, no internal reflections,

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**

The Zn-dominant analogue of collinsite

Structure determined

Triclinic: *P* $\bar{1}$

$$a\ 5.736, b\ 6.767, c\ 5.462\ \text{\AA}, \alpha\ 97.41, \beta\ 108.59, \gamma\ 107.19^\circ$$

Colorless, grey with greenish or bluish tint in aggregates

and larger crystals; vitreous in crystals and silky in ag-

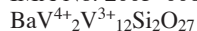
gregates; transparent

Biaxial (+), α 1.6348, β 1.6495, γ 1.6686, $2V_c$ (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* $\bar{3}$

$$a\ 7.6014, c\ 9.2195\ \text{\AA}$$

Steel-grey to black; submetallic to dull; opaque

In reflected light: grey with weak brownish tint; no in-

ternal reflections; weak birefractance, 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**

(OH,F), with La > Ce

Epidote group

Structure determined

Monoclinic: *P2*₁/*m*

$$a\ 8.9616, b\ 5.7265, c\ 10.2353\ \text{\AA}, \beta\ 115.193^\circ$$

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**

Labuntsovite group

Structure determined

Monoclinic: *C2*/*m*

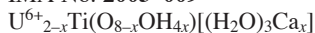
$$a\ 14.596, b\ 14.249, c\ 15.852\ \text{\AA}, \beta\ 117.27(10)^\circ$$

Colorless; vitreous; transparent

Biaxial (+), α 1.657, β 1.666, γ 1.765; $2V$ (meas.) 19–31, $2V$ (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

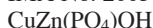
Trigonal: *P* $\bar{3}$

$$a\ 10.824, c\ 7.549\ \text{\AA}$$

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**

The Zn-dominant analogue of libethenite

Structure determined

Orthorhombic: *Pnmm*

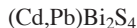
$$a\ 8.3263, b\ 8.2601, c\ 5.8771\ \text{\AA}$$

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**

A member of the pavonite

homologous series

Structure determined

Monoclinic: *C2*/*m*

$$a\ 13.096, b\ 4.004, c\ 14.717\ \text{\AA}, \beta\ 115.602(5)^\circ$$

Dark grey (reddish); metallic; opaque

In reflected light: white, no internal reflections, distinct

birefractance, 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. 2003-012Cu₂[BO(OH)₂](OH)₃

New structure-type

Orthorhombic: *Pnma**a* 9.455, *b* 5.866, *c* 8.668 Å

Blue; vitreous; translucent

Biaxial (–), α 1.627, β 1.699, γ 1.769; 2*V* (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. 2003-013Na₁₂(Mn,Sr,REE)₃Ca₆Fe²⁺₃Zr₃NbSi₂₅O₇₆Cl₂•H₂O

Eudialyte group

Structure determined

Trigonal: *R3m**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. 2003-014Fe₂SiCubic: *Pm3m**a* 2.831 Å

No macroscopic data (grains up to 35 μm)

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(K,Na)₂(Mn,Fe)(Nb,Ti)₄(Si₄O₁₂)₂(O,OH)₄•6H₂O

Labuntsovite group

Structure determined

Monoclinic: *C2/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); 2*V* (meas.) 52, 2*V* (calc.) 46°

6.96(100), 6.40(20), 4.94(80), 3.22(90), 3.10(80), 2.510(40)

IMA No. 2003-016(Hg₂)²⁺₁₀O₆I₃(Br_{1.6}Cl_{1.4})_{Σ3.0}[(CO₃)_{0.8}S²⁻_{0.2}]_{Σ1.0}

Structure determined

Triclinic: *P1**a* 9.344, *b* 10.653, *c* 18.265 Å, α 93.262, β 90.548, γ 115.422°

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

In reflected light: grey; abundant, orange-red to blood-red internal reflections; no bireflectance, no pleochro-

ism; 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(REE,Ca)₄(Fe³⁺,Ti,Fe²⁺,□)(Ti,Fe³⁺,Fe²⁺,Nb)₄Si₄O₂₂

The 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 1.970In reflected light: grey; yellowish grey internal reflections; weak bireflectance 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. 2003-018Na_{5.5}Mn_{0.25}ZrSi₆O₁₆(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; 2*V* (meas.) < 5, 2*V* (calc.) –0°

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. 2003-019Na₆Sr₁₂Ba₂Zr₁₃Si₃₉B₄O₁₂₃(OH)₆•20H₂O

Related to benitoite

Structure determined

Hexagonal: *P6₃cm**a* 26.509, *c* 9.975 Å

Colorless to grey; 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. 2003-020Cu₆GeWS₈Hexagonal: *P6₃/mmc*, *P6₂c* or *P6₃mc**a* 7.523, *c* 12.384 Å

Grey; metallic; opaque

In reflected light: greyish white with a distinct brownish tint; red internal reflections; no pleochroism, weak bireflectance; 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; $2V$ (meas.) 31, $2V$ (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_{T} 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; $2V$ (meas.) 40, $2V$ (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: grey, no internal reflections, no pleochroism, very weak birefractance, 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 grey; metallic; opaque
 In reflected light: white, no internal reflections, no pleochroism, no birefractance, 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**

$(\text{La,Ce})\text{OF}$ Structure determined
 Cubic: $Fm3m$
 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 greyish white; vitreous; transparent
 Biaxial (–), α 1.424, β 1.550, γ 1.65; $2V$ (meas.) 80, $2V$ (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)

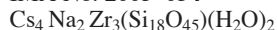
IMA No. **2003-032**

$\text{Tl}(\text{Cl,Br})$ Structure determined
 Sal ammoniac group
 Cubic: $Pm3m$
 a 3.8756 Å
 Grey-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**

$\text{NaFe}^{3+}_2(\text{Mg,Mn})(\text{AsO}_4)_3\cdot \text{H}_2\text{O}$
 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; $2V$ (meas.) 35, $2V$ (calc.) 36.5°
6.40(20), 5.63(20), 3.575(30), 3.202(40), 2.917(35), 2.768(100), 2.611(40)

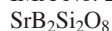
IMA No. **2003–034**

A 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; $2V$ (calc.) 63°
6.32(50), 3.65(50), 3.35(100), 3.14(90), 2.82(50), 2.62(70)IMA No. **2003–035**

The Sr-dominant analogue of danburite

Structure determined

Orthorhombic: $Pnma$ a 8.155, b 7.919, c 8.921 Å

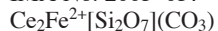
Colorless; vitreous; transparent

Biaxial (–), α 1.597, β 1.627, γ 1.632, $2V$ (meas.) 43, $2V$ (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**

Mn-dominant analogue of gamagarite

Monoclinic: $P2_1/m$ a 9.10, b 6.13, c 7.89, β 112.2°

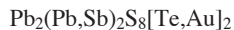
Black-red; vitreous; translucent

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**

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; $2V$ (meas.) 66, $2V$ (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-grey; metallic; opaque

In reflected light: grey color, very low birefractance 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)

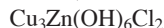
IMA No. **2003–040**

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, $2V$ (meas.) 79.8, $2V$ (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

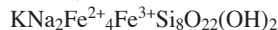
Dark green to blue-green; vitreous; transparent

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: grey 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; $2V$ (meas.) > 60, $2V$ (calc.) 82°
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**

BaNa{(Na,Ti)₄[(Ti,Nb)₂(OH,O)₃Si₄O₁₄](OH,F)₂}
•3H₂O

Heterophyllosilicate Structure determined
Monoclinic: *I11b*

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

Creamy or pale yellow; silky; semitransparent

Biaxial (+), α 1.668, β 1.679, γ 1.710; 2*V* (meas.) 63,
2*V* (calc.) 63°

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**

(U,Th)(Ca,Na)₂(K_{1-x}□_x)Si₈O₂₀•H₂O

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**

Ca₃(Al,Mn³⁺)₂(SiO₄)₂(OH)₄

Garnet group Structure determined

Tetragonal: *I4₁/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**

KMg(PO₄)•6H₂O

Schertelite-struvite group Structure determined

Orthorhombic: *Pmn2₁*

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;
2*V_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**

CuPd

CsCl structure

Cubic: *Pm3m*

a 3.0014 Å

Steel-grey with a bronze tint; metallic; opaque

In reflected light: creamy to bright white, isotropic, no
internal reflections. R(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**

NaCa₂(Mg₃Fe²⁺Al)₅(Si₆Al₂)_{Σ8}O₂₂F₂

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; 2*V* (meas.) 68,
2*V* (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**

Bi₇O₄(MoO₄)₂(AsO₄)₃

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; 2*V* (meas.) 42, 2*V*
(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**

Fe³⁺Ge⁴⁺₃O₇(OH)

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; 2*V* (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**

YTaO₄

Dimorphic relationship 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; trans-
lucent

R(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**

Mn²⁺V³⁺Al(Si₂O₆)(OH)₄

Carpholite group Structure determined

Orthorhombic: *Ccca*

a 13.830, *b* 20.681, *c* 5.188 Å

Pale straw-yellow to brown; vitreous to silky; transpar-
ent

Biaxial (+), α 1.684, β 1.691 (calc.), γ 1.700; 2*V* (meas.)
85°

5.75(100), 5.15(18), 4.72(14), 3.46(15), 3.08(22),
2.641(26)

IMA No. 2003-056

PdSbSe

Ullmannite group

Structure determined

Cubic: $P2_1/3$ a 6.3181 Å

Silver-grey; metallic; opaque

In reflected light: white, isotropic, no internal reflections. R(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 $(\text{Fe}^{2+}, \text{Mg})_6\text{Fe}^{3+}_2(\text{OH})_{18} \cdot 4\text{H}_2\text{O}$

Meixnerite group

Structure determined

Trigonal: Rm a 3.125, c ~22.5 Å

Bluish grey; 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 $\text{Na}_8\text{Al}_8\text{Si}_{28}\text{O}_{72} \cdot 30\text{H}_2\text{O}$

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 $\text{WO}_3 \cdot 0.5\text{H}_2\text{O}$

Related to ferritungstite

Cubic: $Fd3m$ 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 $\text{Sr}_3\text{Al}_{3.5}\text{Si}_{3.5}\text{O}_{10}(\text{OH}, \text{O})_8\text{Cl}_2 \cdot \text{H}_2\text{O}$ New structure-typeMonoclinic: $P2_1/m$, $P2$ 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; $2V$ (meas.) 75, $2V$ (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 $\text{NaNa}_2(\text{Mg}_2\text{Mn}^{3+}\text{LiTi}^{4+})\text{Si}_8\text{O}_{22}\text{O}_2$

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; $2V$ (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°

Grey; metallic; opaque

In reflected light: yellowish to brownish, moderate bireflectance, 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 $\text{Ca}(\text{REE}, \text{Ca})\text{Al}_2(\text{Fe}^{2+}, \text{Fe}^{3+})(\text{SiO}_4)(\text{Si}_2\text{O}_7)\text{O}(\text{OH})$

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: $\text{Na}(\text{NaMn})_{\Sigma 2}(\text{Mg}_4\text{Fe}^{3+})_{\Sigma 5}\text{Si}_8\text{O}_{22}(\text{OH})_2$
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 revised 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 & 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, $n(\text{calc.}) = 1.757$

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**

${}^A\text{Ca}{}^B(\text{Na}_1\text{Li}_1)\text{C}(\text{Fe}^{3+}{}_2\text{Mg}_3)\text{T}\text{Si}_8\text{O}_{22}(\text{OH})_2$

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**

$\text{Ca}_2\text{Fe}^{2+}_4\text{Fe}^{3+}\text{TiSi}_4\text{BeAlO}_{20}$

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 DECISIONS CONCERNING NOMENCLATURE

IMA No. **03-A**

It has been approved that the general CNMMN advocacy of Schaller modifiers [Hey & Gottardi (1980): *Can. Mineral.* **18**, 261-262; Nickel & Mandarinò (1987): *Can. Mineral.* **25**, 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.*, "Mn²⁺-rich", "V(III)-deficient", "Mg-bearing", *etc.*

IMA No. **03-B**

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

IMA No. **03-C**

Naming polytypes of wagnerite: The known polytypes of wagnerite, ideally $\text{Mg}_2(\text{PO}_4)\text{F}$, are named wagnerite-*Ma2bc* (space group $P2_1/c$), wagnerite-*Ma5bc* (space group *Ia*), wagnerite-*Ma7bc* (space group $P2_1$) and wagnerite-*Ma9bc* (space group *Ia*). Polytypes of zwieselite and triplite can be written in analogy with those of wagnerite.

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

NOMENCLATURE OF A MINERAL GROUP

Amphiboles: additions and revisions to the International Mineralogical Association's amphibole nomenclature. See *Can. Mineral.* **41**, 1355-1362 (2003), *Eur. J. Mineral.* **16**, 191-196 (2004), and other journals, and also on the CNMMN website (www.geo.vu.nl/~imacnmmn).

IMA No. 2003–058

Mazzite is 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, Rh_3S_4 , 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 $Rh_{17}S_{15}$. Augé found the same mineral as Kingston in 1988, with the formula Rh_3S_4 (*Can. Mineral.* **26**, 177–192), and this paper was mentioned by Jambor in 1989 (*Am. Mineral.* **74**, 1220).

Britvin *et al.* proposed the mineral miassite (97–029) to the CNMMN with the formula $Rh_{17}S_{15}$. 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 article on miassite in *Zap. Vser. Mineral. Obshchest.* **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 (*Am. Mineral.* **87**, 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 *Can. Mineral.* **40**, 1127–1146 (2002)], 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 Rh_3S_4 as a mineral might reinstate the name “prassoite”.

RECOMMENDATIONS ON CNMMN PROCEDURES

On request of and according to the 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 submicrometric 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.