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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(I)]

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**
$(Ba,Ca,K,Na,Sr)_5Al_9Si_{27}O_{72}•22H_2O$
The Ba-dominant analogue of heulandite Structure determined

Monoclinic: *C*2/*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**
$Na(Ba,Sr,Na,REE)PO_4$
The Ba-dominant analogue of olgite Structure determined

Trigonal: *P*3
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**
$Ba_2Zn(Ti,Nb)_4(Si_4O_{12})_2(O,OH)_4 \bullet 7H_2O$
Labuntsovite 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**
$(Cu,Fe)(Re,Mo)_4S_8$
Cubic: $F\bar{4}3m$
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**
$Ca_2(Zn,Mg)[PO_4]_2 \bullet 2H_2O$
The Zn-dominant analogue of collinsite Structure determined
Triclinic: $P\bar{1}$
a 5.736, *b* 6.767, *c* 5.462 Å, α 97.41, β 108.59, γ 107.19°
Colorless, grey with greenish or bluish tint in aggregates and 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**
$BaV^{4+}{}_2V^{3+}{}_{12}Si_2O_{27}$
New structure-type
Trigonal: $P\bar{3}$
a 7.6014, *c* 9.2195 Å
Steel-grey to black; submetallic to dull; opaque
In reflected light: grey 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**
$(Ca,Fe,Th)(REE,Ca)(Al,Cr,Ti)_2(Mg,Fe,Al)Si_3O_{12}(OH,F)$, with La > Ce
Epidote group Structure determined
Monoclinic: $P2_1/m$
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**
$(Na,Sr,K,Ca)_7(Ti,Nb)_8[Si_4O_{12}]_4(O,OH)_8 \bullet nH_2O$, $n \approx 8$
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; 2*V* (meas.) 19–31, 2*V* (calc.) 35°
7.09(100), 3.24(90), 3.15(80), 3.11(80), 2.54(70), 2.491(70)

IMA No. **2003–009**
$U^{6+}{}_{2-x}Ti(O_{8-x}OH_{4x})[(H_2O)_3Ca_x]$
New structure-type
Trigonal: *P*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**
$CuZn(PO_4)OH$
The Zn-dominant analogue of libethenite Structure determined
Orthorhombic: *Pnnm*
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**
$(Cd,Pb)Bi_2S_4$
A member of the pavonite
homologous series Structure determined
Monoclinic: *C*2/*m*
a 13.096, *b* 4.004, *c* 14.717 Å, β 115.602(5)°
Dark grey (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**
$Cu_2[BO(OH)_2](OH)_3$
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. **2003–013**
$Na_{12}(Mn,Sr,REE)_3Ca_6Fe^{2+}{}_3Zr_3NbSi_{25}O_{76}Cl_2{\bullet}H_2O$
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. **2003–014**
Fe_2Si
Cubic: *Pm*3*m*
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**
$(K,Na)_2(Mn,Fe)(Nb,Ti)_4(Si_4O_{12})_2(O,OH)_4{\bullet}6H_2O$
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); 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**
$(Hg_2)^{2+}{}_{10}O_6I_3(Br_{1.6}Cl_{1.4})_{\Sigma 3.0}[(CO_3)_{0.8}S^{2-}{}_{0.2}]_{\Sigma 1.0}$
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 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 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**
$(REE,Ca)_4(Fe^{3+},Ti,Fe^{2+},\square)(Ti,Fe^{3+},Fe^{2+},Nb)_4Si_4O_{22}$
The Fe-dominant analogue of polyakovite-(Ce) Structure determined
Monoclinic: *C*2/*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: 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. **2003–018**
$Na_{5.5}Mn_{0.25}ZrSi_6O_{16}(OH)_2$
Lovozerite group Structure determined
Monoclinic: *C*2/*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, β ≈ γ 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. **2003–019**
$Na_6Sr_{12}Ba_2Zr_{13}Si_{39}B_4O_{123}(OH)_6{\bullet}20H_2O$
Related to benitoite Structure determined
Hexagonal: $P6_3cm$
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. **2003–020**
Cu_6GeWS_8
Hexagonal: $P6_3/mmc$, $P\bar{6}2c$ or $P6_3mc$
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**
$Cu_2Mg_2(Mg,Cu)(OH)_4(H_2O)_4(AsO_4)_2$
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; 2*V* (meas.) 31, 2*V* (calc.) 42°
8.42(100), 4.32(21), 4.21(64), 3.016(12), 2.907(10), 2.809(7)

IMA No. **2003–022**
$Cs(Be_2Li)Al_2Si_6O_{18}$
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**
$(Zr,Mn)_2(Zr,Ti)(Mn,Na)(Na,Ca)_4(Si_2O_7)_2(O,F)_4$
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_I 1.735; $2V > 90°$
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**
$Th_{0.5}(UO_2)_2Si_5O_{13}•3H_2O$
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; 2*V* (meas.) 40, 2*V* (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**
$(Cu,□)_6(Pb,Bi)Se_4$ 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 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**
$Pb_{21}SnAs_{11}Bi_{11}S_{50}Cl_8Se$ 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 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: $Fm3m$
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**
$Mn(C_2O_4)•2H_2O$
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; 2*V* (meas.) 80, 2*V* (calc.) 77°
4.85(26), 4.80(100), 4.70(84), 3.91(23), 3.62(22), 2.996(58)

IMA No. **2003–030**
$CeCu_6(AsO_4)_3(OH)_6•3H_2O$
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: $Pm3m$
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**
$NaFe^{3+}_2(Mg,Mn)(AsO_4)_3•H_2O$
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; 2*V* (meas.) 35, 2*V* (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**
$Cs_4Na_2Zr_3(Si_{18}O_{45})(H_2O)_2$
A phyllosilicate New structure-type
Monoclinic: *C*2/*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; 2*V* (calc.) 63°
6.32(50), 3.65(50), 3.35(100), 3.14(90), 2.82(50), 2.62(70)

IMA No. **2003–035**
$SrB_2Si_2O_8$
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, 2*V* (meas.) 43, 2*V* (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**
$Ba_2Mn(VO_4)_2(OH)$
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**
$Ce_2Fe^{2+}[Si_2O_7](CO_3)$ 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; 2*V* (meas.) 66, 2*V* (calc.) 64°
4.41(4), 3.61(4), 3.30(5), 2.92(10), 2.65(5), 2.23(5)

IMA No. **2003–039**
$Pb_2(Pb,Sb)_2S_8[Te,Au]_2$
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 bireflectance and pleochroism, distinct anisotropy. R(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**
$(Mg,Cu)SO_4{\bullet}7H_2O$
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, 2*V* (meas.) 79.8, 2*V* (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**
$Cu_3Zn(OH)_6Cl_2$
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**
$CdIn_2S_4$
Linnaeite group
Cubic: *Fd*3*m*
a 10.81 Å
Black; adamantine; translucent
In reflected light: grey color, isotropic, brown-red internal reflections. R(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**
$KNa_2Fe^{2+}{}_4Fe^{3+}Si_8O_{22}(OH)_2$
Amphibole group Structure determined
Monoclinic: *C*2/*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; 2*V* (meas.) > 60, 2*V* (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**
$BaNa\{(Na,Ti)_4[(Ti,Nb)_2(OH,O)_3Si_4O_{14}](OH,F)_2\}\bullet 3H_2O$
Heterophyllosilicate Structure determined
Monoclinic: *I*11*b*
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**
$(U,Th)(Ca,Na)_2(K_{1-x}\square_x)Si_8O_{20}\bullet H_2O$
Steacyite group Structure determined
Tetragonal: *P*4/*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**
$Ca_3(Al,Mn^{3+})_2(SiO_4)_2(OH)_4$
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**
$KMg(PO_4)\bullet 6H_2O$
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**
CuPd
CsCl structure
Cubic: *Pm*3*m*
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**
$NaCa_2(Mg_3Fe^{2+}Al)_5(Si_6Al_2)_{\Sigma 8}O_{22}F_2$
Amphibole group Structure determined
Monoclinic: *C*2/*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**
$Bi_7O_4(MoO_4)_2(AsO_4)_3$ 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**
$Fe^{3+}Ge^{4+}{}_3O_7(OH)$
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**
$YTaO_4$
Dimorphic relationship with formanite Structure determined
Monoclinic: *P*2/*a*
a 5.262, *b* 5.451, *c* 5.110 Å, β 95.12°
Amber brown to brown; vitreous to adamantine; translucent
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**
$Mn^{2+}V^{3+}Al(Si_2O_6)(OH)_4$
Carpholite group Structure determined
Orthorhombic: *Ccca*
a 13.830, *b* 20.681, *c* 5.188 Å
Pale straw-yellow to brown; vitreous to silky; transparent
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**
$(Fe^{2+},Mg)_6Fe^{3+}{}_2(OH)_{18}\bullet 4H_2O$
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**
$Na_8Al_8Si_{28}O_{72}\bullet 30H_2O$
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**
$WO_3\bullet 0.5H_2O$
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**
$Sr_3Al_{3.5}Si_{3.5}O_{10}(OH,O)_8Cl_2\bullet H_2O$ New structure-type
Monoclinic: *P*2/*m*, *P*2 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; 2*V* (meas.) 75, 2*V* (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**
$NaNa_2(Mg_2Mn^{3+}LiTi^{4+})Si_8O_{22}O_2$
Amphibole group Structure determined
Monoclinic: *C*2/*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; 2*V* (meas.) 49, 2*V* (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**
$Na(CaMn)_{\Sigma 2}Mg_5(Si_7Al)O_{22}(OH)_2$
Amphibole group Structure determined
Monoclinic: *C*2/*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; 2*V* (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**
$\square NaFe^{2+}Fe^{3+}Al(PO_4)_3$
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; 2*V* (meas.) 82, 2*V* (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**
$Cu_2AgPbBiS_4$
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**
$Ca(REE,Ca)Al_2(Fe^{2+},Fe^{3+})(SiO_4)(Si_2O_7)O(OH)$
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; 2*V* 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: $Na(NaMn)_{\Sigma 2}(Mg_4Fe^{3+})_{\Sigma 5}Si_8O_{22}(OH)_2$
Amphibole group Structure determined
Monoclinic: *C*2/*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**
$CaB_3O_4(OH)_3$ 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; 2*V* (meas.) 60, 2*V* (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**
$(Al,Ga)_2(Ge,C)O_4(OH)_2$
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**
$^{A}\square\ ^{B}(Na_1Li_1)^{C}(Fe^{3+}{}_2Mg_3)^{T}Si_8O_{22}(OH)_2$
Amphibole group Structure determined
Monoclinic: *C*2/*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**
$Ca_2Fe^{2+}{}_4Fe^{3+}TiSi_4BeAlO_{20}$
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; 2*V* 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 & Mandarino (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*., "Mn^{2+}-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 $Mg_2(PO_4)F$, are named wagnerite-*Ma*2*bc* (space group $P2_1/c$), wagnerite-*Ma*5*bc* (space group *Ia*), wagnerite-*Ma*7*bc* (space group $P2_1$) and wagnerite-*Ma*9*bc* (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/~ima-cnmmn).

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 discrediation 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.