

NEW MINERALS RECENTLY APPROVED IN 1998 BY THE COMMISSION ON NEW MINERALS AND MINERAL NAMES INTERNATIONAL MINERALOGICAL ASSOCIATION

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. (any relationship to other minerals)
Chemical Formula
Crystal system, space group
unit cell parameters
Colour; lustre; 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

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1998 PROPOSALS

IMA No. 98-001

Cu₃(AsO₄)₂·4H₂O

New structure type

Orthorhombic: *Pnma*

a 5.6906, *b* 17.061, *c* 9.732 Å

Bottle green; vitreous; transparent

Biaxial (–), α 1.745, β 1.755, γ 1.760, *2V*(meas) 71°, *2V*(calc) 70°

8.52(100), 3.721(60), 3.221(90), 3.102(40), 2.817(35), 2.795(35), 2.350(25)

IMA No. 98-002

Ca₃Ge(OH)₆(SO₄)(CO₃)·12H₂O

A member of the ettringite group; structure

Hexagonal: *P6₃/m*

a 11.056, *c* 10.629 Å

White; vitreous; transparent

Uniaxial (–), ω 1.509, ϵ 1.479

9.57(vs), 5.53(s), 3.83(s), 3.56(ms), 3.44(m), 2.74(ms), 2.53(m)

IMA No. 98-003

(Ca,Fe³⁺)₂Cu₅(Bi,Cu)(PO₄)₄(H₂O,OH,Cl)₁₃

The Bi-P-dominant analogue of rechseldorfite

Monoclinic: *C2/m*

a 14.200, *b* 13.832, *c* 14.971 Å, β 102.08°

Honey-brown; resinous; translucent

Biaxial (–), α 1.718, β 1.748, γ 1.748, *2V*(calc) 0°

14.57(100), 6.95(40), 6.28(40), 3.469(30b), 3.104(30), 2.816(40), 2.506(30), 2.452(30)

IMA No. 98-004

Pb₃₂As₄₀S₉₂

A member of the rathite (sartorite) group

Monoclinic: *P2₁*

a 8.368, *b* 115.75, *c* 7.903 Å, β 90.11°

Lead-gray; metallic; opaque

In reflected light: deep red, anisotropic. *R*_{min} & *R*_{max}:

37.9, 41.8% (470 nm), 36.5, 40.8% (546 nm), 35.0, 39.7% (589 nm), 32.7, 37.7% (650 nm)

3.663(70), 3.216(48), 2.978(100), 2.872(48), 2.735(60), 2.713(50), 2.339(65)

- IMA No. 98-006
 $\text{MnPO}_4 \cdot \text{H}_2\text{O}$ Related to the kieserite group
 Monoclinic: $C2/c$
 a 6.914, b 7.468, c 7.364 Å, β 112.29°
 Dark brown to dark greenish black; adamantine;
 translucent
 Biaxial α 1.75, β 1.79, γ >1.79
 4.856(12), 4.633(15), 3.503(100), 3.271(10),
 2.957(10), 2.516(19), 2.104(12)
- IMA No. 98-007
 $(\text{, Na})_1\text{Ca}_2(\text{Mn}^{2+}, \text{Mg}, \text{Fe}^{2+})_2(\text{Fe}^{3+}, \text{Mg}, \text{Al})_2$
 $\text{Mn}_2^{+}(\text{PO}_4)_6(\text{H}_2\text{O})_2$
 Isostructural with wicksite and grischunite; structure
 Orthorhombic: $Pcab$
 a 12.559, b 12.834, c 11.714 Å
 Very dark brown to black; vitreous; transparent
 Biaxial (–), α 1.729, β 1.738, γ 1.741, $2V(\text{meas})$ 54°,
 $2V(\text{calc})$ 60°
 6.419(31), 3.006(67), 2.927(78), 2.856(31), 2.814(35),
 2.768(100), 2.110(33)
- IMA No. 98-009
 $\text{Cu}_3\text{O}[(\text{Mo}, \text{S})\text{O}_4\text{SO}_4]$
 Unique combination of elements; structure
 Orthorhombic: $Pnma$
 a 7.420, b 6.741, c 13.548 Å
 Olive-green; vitreous; transparent
 Average refractive index 1.925 (calculated from
 reflectance)
 3.391(60), 3.342(60), 3.077(100), 2.542 (60),
 2.500(60), 2.275(60)
- IMA No. 98-010
 $\text{Ca}_4\text{Al}_6\text{Si}_6\text{O}_{24}(\text{SO}_4)$
 A member of the scapolite group; structure
 Tetragonal: $I4/m$
 a 12.182, c 7.604 Å
 Colourless to slightly yellow; subvitreous; transparent
 Uniaxial (–), ω 1.585, ε 1.553
 3.83(20), 3.46(100), 3.08(40), 3.05(15), 2.70(15)
- IMA No. 98-012
 $\text{Cu}_3(\text{OH})_2(\text{As}_2\text{O}_7)$ Related to olivenite; structure
 Orthorhombic: $Pmma$
 a 8.3212, b 2.9377, c 4.6644 Å
 Dark pistachio green; vitreous to adamantine;
 translucent
 Biaxial (+), α 1.81, β 1.82, γ 1.86, $2V(\text{meas})$ 57°,
 $2V(\text{calc})$ 54°
 3.104(100), 2.486(70), 2.400(25), 1.672(30),
 1.596(25), 1.330(25)
- IMA No. 98-013
 $\text{Cu}_4\text{Al}_3(\text{OH})_{14}\text{F}_3 \cdot 2\text{H}_2\text{O}$ New structure type
 Monoclinic: $C2/m$
 a 12.346, b 2.907, c 10.369 Å, β 97.90°
 Bright blue; vitreous; translucent
- Biaxial (+), α 1.585, β 1.615, γ 1.648, $2V(\text{calc})$ 89°
 10.29(80), 5.589(90), 4.232(100), 2.828(90),
 2.362(100), 2.006(100), 1.871(80)
- IMA No. 98-014
 $\text{Pb}(\text{Zn}, \text{Fe}, \text{Cu})_2(\text{AsO}_4)_2(\text{OH}, \text{H}_2\text{O})_2$
 The Zn-dominant analogue of gartrellite; structure
 Triclinic: ? $\text{tf} = \text{"PS2B42"} > \text{P}\bar{1}$
 a 5.550, b 5.620, c 7.621 Å, α 68.59, β 69.17, γ
 69.51°
 Green-yellow; vitreous; transparent to translucent
 Biaxial (–), α 1.91, β 1.94 (calc), γ 1.97, $2V(\text{meas})$ 87°
 4.731(74), 4.669(86), 3.283(89), 3.252(91),
 2.999(100), 2.894(74), 2.880(70)
- IMA No. 98-015
 $\text{Pb}(\text{Co}, \text{Ni}, \text{Zn}, \text{,})_2(\text{AsO}_4)_2 \cdot 2\text{H}_2\text{O}$
 The Co-dominant analogue of helmutwinklerite;
 structure
 Triclinic: $P\bar{1}$
 a 11.216, b 10.604, c 7.618 Å, α 100.10, β 110.26,
 γ 98.87°
 Red to red-brown; vitreous; translucent
 Biaxial (+), α 1.85(calc), β 1.87, γ 1.90, $2V(\text{meas})$ 85°
 4.670(97), 3.256(100), 3.170(29), 3.072(56),
 2.890(40), 2.760(37), 2.568(46)
- IMA No. 98-017
 $\text{Mg}(\text{H}_2\text{O})_6[\text{Sb}(\text{OH})_6]_2$
 The Mg-dominant analogue of bottinoite; structure
 Trigonal: $P3$
 a 16.114, c 9.863 Å
 Colourless; vitreous; transparent
 Uniaxial (–), ω 1.570, ε 1.569
 4.946(50), 4.636(100), 4.217(20), 3.392(70),
 2.595(20), 2.356(40), 2.103(20)
- IMA No. 98-018
 $(\text{Na}, \text{Ca}, \text{Bi})_2\text{Ta}_2\text{O}_6\text{F}$
 A member of the microlite group; structure
 Cubic: $Fd3m$
 a 10.4451 Å
 Green; adamantine; transparent
 Isotropic, $\eta > 2.0$, 2.03(calc)
 6.023(31), 3.148(33), 3.015(100), 2.610(27),
 1.846(59), 1.574(47), 1.198(23)
- IMA No. 98-019
 $\text{Na}_{3-x}(\text{Ti}, \text{Nb})_2 [\text{Si}_4\text{O}_{12}](\text{OH}, \text{O})_2 \cdot 3-4\text{H}_2\text{O}$
 The Ti-dominant analogue of nenadkevichite;
 structure
 Orthorhombic: $Pbam$
 a 7.349, b 14.164, c 7.130 Å
 Colourless; vitreous; transparent
 Biaxial (+), α 1.646, β 1.654, γ 1.763, $2V(\text{meas})$ 30°,
 $2V(\text{calc})$ 32°
 7.09(72), 6.53(85), 3.262(100), 3.180(52), 2.553(56),
 2.075(57), 1.735(50)

IMA No. 98-023

(Ni,Fe)₃P

The Ni-dominant analogue of schreibersite

Tetragonal: $\bar{I}4$ a 8.99, c 4.396 Å

White with pinkish yellow-tint; metallic; opaque

In reflected light: weak anisotropy in oil, in yellowish-pinkish colours. $R_{\min}$ & $R_{\max}$: 42.3, 43.9% (460 nm), 45.7, 47.5% (540 nm), 47.6, 49.1% (580 nm), 50.3, 51.7% (640 nm)

2.17(10), 2.13(5), 2.08(5), 1.955(7)

IMA No. 98-024

(Fe³⁺, Zn)₁₂(As³⁺, Si)₈O₃₀

New structure type

Hexagonal: $P6_3mc$ a 12.771, c 5.051 Å

Brownish black; vitreous; transparent

Uniaxial (+), ω ~ 1.99, ϵ ~ 2.08

6.37(80), 3.221(100), 2.531(40), 2.420(70), 1.788(40), 1.672(50), 1.507(50)

IMA No. 98-025

NaCa₂Al₂(AsO₄)[AsO₃(OH)](OH)₂F₄(H₂O)

New structure type

Monoclinic: $P2_1/m$ a 9.687, b 10.7379, c 5.5523 Å, β 105.32°

Pale blue-green; vitreous; transparent to translucent

Biaxial (–), α 1.580, β 1.588, γ 1.593, $2V(\text{meas})$ 74°, $2V(\text{calc})$ 76°

5.364(80), 4.796(80), 3.801(80), 3.527(90), 2.966(100), 2.700(90), 2.246(60)

IMA No. 98-026

[Zn_{1–x}Al_x(OH)₂][(SO₄)_{x/2}(H₂O)_n] $x = 0.33$, $n \approx 0.96$

A member of the hydrotalcite group; polytype 1T

Trigonal: $P\bar{3}$ a 3.063, c 8.91 Å

Pale blue; waxy; translucent

Uniaxial, $\eta(\text{max})$ 1.558

8.81(100), 4.406(2.5), 2.654(4), 2.545(5)

[Zn_{1–x}Al_x(OH)₂][(SO₄)_{x/2}(H₂O)_n] $x = 0.32–0.50$, $n = 0.59$

Polytype 3R

Trigonal: $R\bar{3}m$ a 3.065, c 25.42 Å

Pale bluish to bluish-white; waxy; translucent

Uniaxial, ω 1.5636

8.50(100), 4.248(33), 2.600(5), 2.354(4)

IMA No. 98-027

(Al,Mg,Fe)₁₆(Al,Si,Be)₁₂O₄₀

A member of the sapphirine group

Monoclinic: $P2_1/c$ a 9.9000, b 14.369, c 11.2537 Å, β 125.53°

Very dark green; vitreous; transparent

Biaxial (–), α 1.725, β 1.740, γ 1.741, $2V(\text{meas})$ 34°, $2V(\text{calc})$ 29°

2.985(38), 2.834(30), 2.826(45), 2.566(36), 2.445(100), 2.439(44), 2.340(43)

IMA No. 98-028

Fe²⁺Ti(Ta,Nb)₂O₈ A member of the wodginite groupMonoclinic: $C2/c$ a 9.402, b 11.384, c 5.075 Å, β 90.33°

Very dark brown to black; opaque; submetallic

In reflected light: creamy white, very abundant internal reflections, anisotropic, moderate pleochroism. $R_{\min}$ & $R_{\max}$: 18.2, 18.7% (470nm), 18.1, 19.1% (546nm), 16.9, 17.9% (589nm), 15.6, 16.4% (650nm)

3.626(70), 2.963(100), 2.939(90), 2.484(45), 1.759(45), 1.715(50), 1.711(45)

IMA No. 98-030

Ca(HCOO)₂ β -calcium formateTetragonal: $P4_2/2_12$ a 6.770, c 9.463 Å

White, light-blue; vitreous; transparent

Uniaxial (+), ω 1.553, ϵ 1.573

5.54(90), 3.40(100), 3.19(60), 2.859(80), 2.196(70), 2.046(50), 1.947(60)

IMA No. 98-031

(MoO₂)₂As₂O₅·3H₂O

New structure type

Monoclinic: $P2_1/c$ a 7.0516, b 12.0908, c 12.2190 Å, β 101.268°

Green to grey-green; vitreous, translucent

Biaxial (+), α 1.757, β 1.778, γ 2.04, $2V(\text{calc})$ 35°
6.92(26), 6.05(100), 3.457(16), 3.325(59), 2.624(15), 2.593(12), 2.264(19)

IMA No. 98-032

Cu₁₀(AsO₄)₄(SO₄)(OH)₆·8H₂O

Structure

Monoclinic: $C2/c$ a 21.778, b 12.317, c 10.716 Å, β 92.81°

Green with a bluish tint; vitreous; transparent

Biaxial (–), α 1.590, β 1.740, γ 1.744, $2V(\text{meas})$ 18°, $2V(\text{calc})$ 17°

10.8(100), 5.43(50), 4.90(30), 3.625(50), 3.090(40), 2.675(40), 2.630(60)

IMA No. 98-033

Zn₂AlSb(OH)₁₂

Related to cualstibite; structure

Trigonal: $P\bar{3}12$ a 5.327, c 9.792 Å

Colourless; vitreous; transparent

Optical properties could not be measured

4.897(100), 4.615(35), 4.180(57), 3.366(18), 2.667(31), 2.342(88), 1.887(10)

IMA No. 98-034

SrAl₂Si₂O₇(OH)₂·H₂O

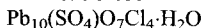
A member of the lawsonite group

Orthorhombic: $Cmcm$ a 6.031, b 8.945, c 13.219 Å

Blue; vitreous; transparent

Biaxial (+), α 1.664, β 1.674, γ 1.688, $2V(\text{calc})$ 81°
4.68(s), 4.26(vs), 3.31(vs), 2.75(vs), 2.68(vvs), 2.63(s), 2.50(s)

IMA No. 98-035



Related to the nadorite and komatite groups;

structure

Triclinic: $P\bar{1}$ a 8.796, b 10.768, c 13.096 Å, α 68.87, β 86.52, γ 75.79°

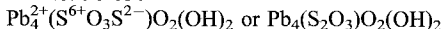
Venetian pink; vitreous; translucent

In reflected light: colourless or pale pink, anisotropic.

 $R_{\min}$ & $R_{\max}$: 14.3, 14.6% (470nm), 13.6, 13.9% (546nm), 13.4, 13.75% (589nm), 13.3, 13.55% (650nm)

6.573(4), 3.768(4), 3.286(9), 2.955(9), 2.911(10), 2.793(8)

IMA No. 98-036



New structure type

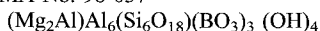
Triclinic: $P\bar{1}$ a 7.455, b 6.496, c 11.207 Å, α 114.33, β 89.65, γ 88.69°

Beige-cream to colourless; vitreous to pearly; opaque to transparent

In reflected light: light grey with yellow-brown internal reflections, bireflectant and slightly pleochroic.

10.13(100), 5.93(50), 4.401(35), 3.414(100), 3.198(80), 2.889(35), 2.805(35), 2.622(40)

IMA No. 98-037



A member of the tourmaline group; structure

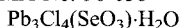
Trigonal: $R3m$ a 15.884, c 7.178 Å

Bluish grey; dull; transparent

Uniaxial (—), ω 1.650, ϵ 1.624

6.366(6), 4.211(9), 3.969(10), 3.470(6), 2.949(7), 2.567(10), 2.037(5)

IMA No. 98-038



Structure

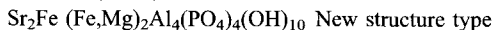
Triclinic: $P\bar{1}$ a 8.115, b 8.433, c 9.242 Å, α 62.52, β 71.87, γ 75.01°

Colourless to white; vitreous to silky, diaphaneity not given

 η 1.96, birefringent

3.548(m), 3.258(s), 3.188(s), 2.728(m), 2.365(s), 2.298(m)

IMA No. 98-039

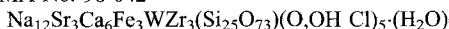
Triclinic: $P\bar{1}$ a 5.455, b 9.118, c 9.769 Å, α 108.48, β 91.62, γ 97.38°

Pale blue to dark-yellow green; vitreous; transparent to translucent

Biaxial: α 1.660, γ 1.684

4.473(47), 3.596(75), 3.470(45), 3.215(100), 3.132(75), 3.016(54), 2.878(43), 2.811(60)

IMA No. 98-042



A member of the eudialyte group;

structure

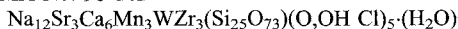
Trigonal: $R3m$ a 14.2958, c 30.084 Å

Orange-red; vitreous; transparent to translucent

Uniaxial (—): ω 1.6279, ϵ 1.6254

See X-ray powder data for IMA No. 98-043

IMA No. 98-043



A member of the eudialyte group

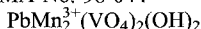
Trigonal: $R3m$ a 14.282, c 30.12 Å

Orange; vitreous; transparent to translucent

Uniaxial (—): ω 1.629, ϵ 1.626

11.50(90), 9.535(70), 6.452(50), 6.072(50), 5.735(50), 3.406(50), 3.213(50), 3.167(50), 2.980(100), 2.856(80)

IMA No. 98-044



A member of the tsumcorite group; structure

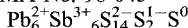
Monoclinic: $C2/m$ a 9.275, b 6.284, c 7.682 Å, β 117.97(4)°

Dark brown to black; vitreous to adamantine; translucent to opaque

In reflected light: light grey to light brownish grey, strong anisotropism (dark metallic blue to light purplish brown-grey), distinct bireflectance, slight pleochroism. $R_{\min}$ & $R_{\max}$: 15.8, 19.2% (470 nm), 14.8, 17.8% (546 nm), 14.4, 17.3% (589 nm), 14.1, 16.8% (650 nm)

4.695(34), 3.388(95), 3.270(100), 2.946(51), 2.850(49), 2.491(93), 1.869(35), 1.697(83), 1.6378(31)

IMA No. 98-045



Structure

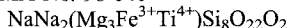
Orthorhombic: $P2_122_1$ a 5.328, b 4.0400, c 23.054 Å

Black; metallic; opaque

Reflectance data could not be obtained

3.724(ms), 3.559(m), 3.427(s), 3.232(m), 3.047(ms), 2.952(m), 2.844(ms), 2.779(ms), 2.753(ms), 2.422(m)

IMA No. 98-046



A member of the amphibole group; structure

Monoclinic: $C2/m$ a 9.795, b 17.949, c 5.290 Å, β 104.19(2)°

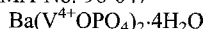
Pink; vitreous; transparent

Biaxial (—), α 1.643, β 1.657, γ 1.670, $2V(\text{meas})$ 81°, $2V(\text{calc})$ 87°

NEW 1998 MINERALS

8.414(100), 4.467(50), 3.390(60), 3.117(50),
2.705(70), 2.531(50)

IMA No. 98-047



The Ba-dominant analogue of sincosite

Tetragonal: $P4/n$ or $P4/nmm$

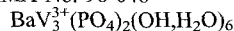
a 9.031, c 12.755 Å

Pale green; vitreous; transparent

Uniaxial (–), ω 1.721, ϵ 1.715

5.722(100), 4.519(40), 3.548(30b), 3.192(60),
3.101(40), 2.858(50), 2.794(50), 2.375(70),
2.022(50)

IMA No. 98-048



A member of the crandallite group

Trigonal: $R\bar{3}m$, $R3m$ or $R32$

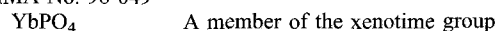
a 7.258, c 17.361 Å

Black; adamantine to semimetallic; opaque

Uniaxial (–), ω 1.858, ϵ 1.817

5.90(9), 3.627(4), 3.073(10), 2.301(4), 1.971(5),
1.814(4)

IMA No. 98-049



Tetragonal: $I4_1/amd$

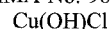
a 6.866, c 6.004 Å

Colourless to slightly yellow or brown; vitreous;
transparent

Uniaxial (+), ω 1.717, ϵ 1.802

4.515(7), 3.437(10), 2.730(3), 2.556(8), 2.138(3),
1.760(5)

IMA No. 98-054



Monoclinic: $P2_1/a$

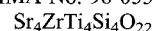
a 5.552, b 6.668, c 6.124(2) Å, β 115.00(3)°

Yellowish-green to olive-green; vitreous; transparent
to translucent

Probably biaxial, $\eta > 1.8$

5.553(100), 2.785(14), 2.516(18), 2.241(27),
1.996(12), 1.851(21), 1.869(16)

IMA No. 98-055



The Sr-Zr-dominant analogue of perrierite

Monoclinic: $P2_1/a$

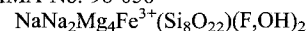
a 13.97, b 5.675, c 11.98 Å, β 114.26(8)°

Dark brown; adamantine; diaphaneity not given

Optical properties could not be measured

4.15(m), 3.20(m), 3.12(s), 3.05(vvs), 2.99(vs), 2.84(s),
2.78(m), 2.74(s), 2.51(m), 2.30(m), 1.967(m)

IMA No. 98-056



A member of the amphibole group

Monoclinic: $C2/m$

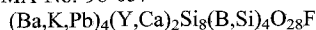
a 9.81, b 18.05, c 5.29 Å, β 103.9(2)°

Grey; vitreous; transparent to translucent

Biaxial (–), α 1.618, β 1.629, γ 1.633, $2V(\text{meas})$ 54°,
 $2V(\text{calc})$ 61.8°

8.42(34), 3.264(23), 3.129(100), 2.804(28), 2.716(10),
2.708(10), 1.895(10), 1.654(10)

IMA No. 98-057



The Y-dominant analogue of hyalotekite; structure

Triclinic: $\bar{1}$

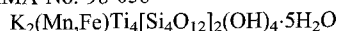
a 11.181, b 10.850, c 10.252 Å, α 90.64, β 90.05, γ
89.97°

Light pink to white; vitreous; translucent

Biaxial (+), α 1.637, β 1.628, γ 1.624, $2V(\text{meas})$ 69°,
 $2V(\text{calc})$ 67°

7.79(65), 3.773(100), 3.742(70), 3.493(56), 2.936(50),
2.921(37), 2.912(42), 2.564(35)

IMA No. 98-058



A member of the labuntsovite group; structure

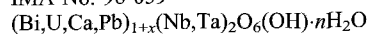
Monoclinic: $C2/m$

a 14.369, b 13.906, c 7.812 Å, β 117.09°

Yellow; vitreous; transparent

Biaxial (+), α 1.683, β 1.687, γ 1.775, $2V(\text{calc})$ 25°
7.00(9), 6.33(8), 4.86(7), 3.17(10), 3.08(5), 2.58(4),
2.47(4), 1.551(4)

IMA No. 98-059



A member of the pyrochlore group

Metamict, Cubic after heating: $Fd\bar{3}m$

a 10.41 Å

Dark greenish-brown to brown; vitreous; translucent

Isotropic, η 2.10

5.98(4), 2.967(10), 2.614(7), 1.848(9), 1.569(9),
1.500(4), 1.195(8), 1.145(5)

IMA No. 98-060



Orthorhombic: $Bbmm$

a 13.18, b 37.4, c 4.05(3) Å

Silver grey; metallic; opaque

In reflected light: white, distinct anisotropism (without
colour effects), very weak bireflectance, nonpleo-
chroic. $R_{\min}$ & $R_{\max}$: 35.8, 40.2% (460 nm), 35.3,
40.6% (540 nm), 35.0, 40.6% (580 nm), 34.8,
40.1% (640 nm)

3.80(10), 3.58(3), 3.40(2), 3.30(3), 2.95(4b), 2.92(2),
2.81(2), 2.34(4b), 1.917(2b)

IMA No. 98-061



A member of the amphibole group; structure

Monoclinic: $C2/m$

a 9.536, b 17.789, c 5.277 Å, β 102.53°

Green; vitreous; translucent

Biaxial (+), α 1.694, β 1.698, γ 1.702, $2V(\text{meas})$ 83°,
 $2V(\text{calc})$ 85°

8.25(24), 4.45(22), 3.396(28), 3.057(100), 2.749(54),
2.699(60), 1.920(20), 1.639(44), 1.396(23)

IMA No. 98-062

(Zn,Mn)(Mn²⁺,Mg,Fe,³⁺Al)₁₄(As³⁺O₃)

(As⁵⁺O₄)₂(OH)₂₃

New structure type

Monoclinic: *Cc*

a 14.236, *b* 8.206, *c* 24.225 Å, β 93.52°

Red-brown to orange-brown; resinous to submetallic;
opaque

Biaxial (–), α 1.723, β 1.744, γ 1.750, 2*V*(meas) 44°,
2*V*(calc) 56°

12.07(100), 6.05(100), 4.12(30), 9.04(90), 3.148(30),
3.030(70), 2.411(40), 1.552(70)

IMA No. 98-064

Na₁₅Ca₃Mn₃Fe₃Zr₃Nb(Si₂₅O₇₃)(O,OH,H₂O)₃(OH,Cl)₂

A member of the eudialyte group; structure

Trigonal: *R3*

a 14.192, *c* 29.983 Å

Yellowish brown; vitreous; transparent to translucent

Uniaxial (–), ω 1.6450, ε 1.6406

11.35(44), 7.10(33), 6.02(36), 5.68(31), 4.29(36),
3.389(43), 3.199(31), 3.150(35), 3.013(30),
2.964(100), 2.844(89)

IMA No. 98-065

Mg₉[Si₄O₁₆](OH)₂

A member of the humite group; structure

Monoclinic: *P2₁/b* (unique axis *a*)

a 4.7480, *b* 10.2730, *c* 13.6894 Å, α 100.72°

Yellow-orange; vitreous, transparent

Biaxial (+), α 1.631, β 1.641, γ 1.664, 2*V*(meas) 70°,
2*V*(calc) 68°

5.05(70), 4.46(52), 3.35(64), 2.772(91), 2.748(50),
2.551(80), 2.516(93), 2.365(50), 2.269(100),
2.259(95), 1.747(79), 1.485(51)

IMA No. 98-066

CaMg(VO₄,AsO₄)(OH)

A member of the descloizite group; structure

Orthorhombic: *P2₁2₁2₁*

a 7.501, *b* 9.010, *c* 5.941 Å

Orange to orange-brown; adamantine; transparent

Biaxial, α 1.797, β 1.805–1.815, γ 1.828

4.50(72), 4.14(32), 3.170(100), 2.972(20), 2.785(30),
2.639(27), 2.596(21), 2.523(30), 1.733(20),
1.614(41)

IMA No. 98-067

Cu[AlAsO₅]

New structure type

Monoclinic: *P2₁/c*

a 7.314, *b* 10.223, *c* 5.576 Å, β 99.79°

Light green; vitreous; translucent

Biaxial(–), α 1.672, β 1.718, γ 1.722, 2*V*(calc) 32°
7.20(100), 4.84(9), 4.33(23), 3.604(10), 3.125(20),
2.656(6), 2.458(8)

IMA No. 98-069

K₂MnV₄O₁₂

New structure type

Monoclinic: *P2₁/n*

a 8.173, *b* 9.243, *c* 8.640 Å, β 109.70°

Reddish brown; adamantine; translucent

Biaxial, α 1.925 β 1.960, γ > 1.988, 2*V*(meas) 82°
6.86(25), 5.91(27), 5.51(32), 3.957(25), 3.701(55),
3.336(100), 3.118(50), 3.000(36), 2.878(64),
2.752(68), 1.968(28), 1.860(28)

Proposals from Previous Years Approved in 1998

IMA No. 97-033

(Mn,Fe,Mg)Al₂(PO₄)₂(OH)₂·8H₂O

Polymorph of mangangordonite

Triclinic: *P1̄*

a 7.0102, *b* 10.2050, *c* 10.5040(7) Å, α 71.82, β
89.62, γ 69.90(1)°

Colourless to beige; vitreous; translucent to trans-
parent

Biaxial (–), α 1.5665, β 1.5740, γ 1.5815, 2*V*(meas.)
94.7°, 2*V*(calc.) 90.6°
9.92(85), 6.54(100), 5.80(55), 4.746(85), 4.577(35),
3.885(30), 3.001(70), 2.900(30), 2.773(35)

[Manuscript received 10 March 1999]