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Association

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**New minerals recently approved  
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**

J.A. Mandarino, Chairman Emeritus, and J.D. Grice, Chairman  
Commission on New Minerals and Mineral Names, International Mineralogical Association

**1997 Proposals**

IMA No. 97-001

Chemically related to paulkerrite  
 $(\text{Bi},\text{Pb})_2\text{Fe}(\text{O},\text{OH})_3\text{PO}_4$

Monoclinic: C2/m  
a 12.278, b 3.815, c 6.899 Å,  $\beta$  111.14°.  
Black to dark brown; vitreous to adamantine;  
opaque to translucent.  
Biaxial (–),  $\alpha$  2.06,  $\beta$  2.15(calc),  $\gamma$  2.19,  
2V(meas.) 70°.  
5.726 (54), 3.372 (77), 3.322 (37), 3.217 (46),  
3.011 (100), 2.863 (34), 2.750 (62).

IMA No. 97-002

The boron-dominant analogue of gehlenite  
(melilite group)  
 $\text{Ca}_2\text{B}_2\text{SiO}_7$   
Tetragonal: P4<sub>2</sub>1m

a 7.116, c 4.815 Å.

Creamy-white; earthy; earthy.

Probably uniaxial (–), n 1.67.

3.479 (40), 2.862 (55), 2.654 (100), 2.231 (15),  
2.129 (20), 1.920 (35), 1.644 (20).

IMA No. 97-003

The Ti-dominant analogue of nenashevichite  
 $\text{NaK}_2(\text{Ti},\text{Nb})_2\text{Si}_4\text{O}_{12}(\text{O},\text{OH})_2 \cdot 2\text{H}_2\text{O}$   
Monoclinic: C2/m

a 14.39, b 13.900, c 7.825 Å,  $\beta$  117.6°.  
Colourless; vitreous; transparent to trans-

lucent.  
Biaxial (+),  $\alpha$  1.667,  $\beta$  1.677,  $\gamma$  1.802,  
2V(meas.) 32°, 2V(calc.) 33°.  
6.94 (61), 6.39 (43B), 3.186 (100), 3.100 (96),  
2.600 (28), 2.586 (28), 2.489 (24).

## IMA No. 97-004

A polymorph of miargyrite  
 $\text{AgSbS}_2$   
 Cubic: Fm3m  
 a 5.650  
 Greyish black; metallic; opaque.  
 In reflected light: grey. R: (34.5%) 470 nm, (33.8%) 546 nm, (32.8%) 589 nm, (28.7%) 650 nm.  
 3.26 (9), 2.83 (10), 1.998 (8), 1.703 (6), 1.630 (5), 1.296 (2), 1.263 (3).

## IMA No. 97-005

$(\text{UO}_2)\text{H}(\text{AsO}_3)$   
 Tetragonal: space group unknown  
 a 11.00, c 15.96 Å  
 Yellow; dull; translucent.  
 Uniaxial (-),  $\omega$  1.84,  $\epsilon$  1.75.  
 5.58 (8), 4.95 (10), 4.40 (6), 3.33 (8), 3.03 (6), 2.91 (5).

## IMA No. 97-007

The Mn<sup>2+</sup>-dominant analogue of nordite-(Ce)  
 $\text{Na}_3\text{SrCeMnSi}_6\text{O}_{17}$   
 Orthorhombic: Pcca  
 a 14.449, b 5.187, c 19.849 Å  
 Colourless, pale-brownish, brown; vitreous; transparent.  
 Biaxial (-),  $\alpha$  1.623,  $\beta$  1.636,  $\gamma$  1.642,  
 2V(meas.) 60°, 2V(calc.) 68°.  
 7.22 (38), 4.215 (100), 3.326 (67), 2.965 (83), 2.875 (55), 2.597 (54), 2.443 (35).

## IMA No. 97-008

The Fe<sup>2+</sup>-dominant analogue of nordite-(Ce)  
 $\text{Na}_3\text{SrCeFeSi}_6\text{O}_{17}$   
 Orthorhombic: Pcca  
 a 14.460, b 5.187, c 19.848 Å  
 Colourless or light coffee-colour; vitreous; transparent.  
 Biaxial (-),  $\alpha$  1.623,  $\beta$  1.636,  $\gamma$  1.642,  
 2V(meas.) 60°, 2V(calc.) 68°.  
 7.22 (41), 4.216 (100), 3.325 (67), 2.964 (73), 2.879 (62), 2.595 (46), 2.444 (31).

## IMA No. 97-009

The calcium- and arsenate-dominant member of the mixite group  
 $\text{CaCu}_6[(\text{AsO}_4)_2(\text{AsO}_3\text{OH})(\text{OH})_6] \cdot 3\text{H}_2\text{O}$   
 Hexagonal: P6<sub>3</sub>/m  
 a 13.571, c 5.880 Å  
 Pale green; vitreous; transparent.  
 Uniaxial (+),  $\omega$  1.688,  $\epsilon$  1.765.  
 11.64 (100), 4.431 (41), 3.387 (17), 3.254 (22), 2.9347 (42), 2.6932 (29), 2.5624 (30).

## IMA No. 97-010

$\text{Pb}_4\text{As}_2\text{S}_7$   
 Orthorhombic: Pba2 or Pbam  
 a 15.179, b 38.117, c 4.0428 Å  
 Silvery lead grey; metallic; opaque.  
 In reflected light: white with a greenish tint, distinct anisotropism (dark grey to greenish grey, weak bireflectance, weak pleochroism).  $R_{\min.}$  &  $R_{\max.}$ : (33.8, 34.0%) 470 nm, (31.8, 31.9%) 546 nm, (31.2, 31.3%) 589 nm, (30.4, 30.4%) 650 nm.  
 4.462 (40), 3.699 (37), 3.392 (100), 2.817 (45), 2.735 (31), 2.156 (25), 2.150 (22).

## IMA No. 97-012

$\text{Ca}(\text{Al},\text{Fe}^{2+},\text{Mg},\text{Mn})_2(\text{AsO}_4)_2(\text{OH})_2$   
 Monoclinic: C2  
 a 8.9252, b 6.1427, c 7.352 Å,  $\beta$  115.25°  
 Light brownish to brownish pink, orange-brown; vitreous; transparent.  
 Biaxial (sign unknown),  $n$  1.76 parallel to fibre,  $n$  1.70 perpendicular to fibre.  
 4.914 (58), 3.376 (65), 3.164 (100), 3.084 (61), 2.945 (72), 2.687 (53), 2.522 (84).

## IMA No. 97-013

$\text{Ca}_8\text{Mg}(\text{SiO}_4)_4\text{Cl}_2$   
 Cubic: Fd $\bar{3}$   
 a 15.0850 Å  
 Orange brown to amber; vitreous; transparent.  
 Isotropic,  $n$  1.676.  
 2.901 (40), 2.666 (100), 2.549 (30), 1.9637 (30), 1.8845 (30), 1.7774 (30), 1.5400 (50), 1.4585 (30).

## IMA No. 97-014

Chemically and structurally related to sinhalite  
 $\text{Mg}_2\text{Al}_3\text{B}_2\text{O}_9(\text{OH})$   
 Monoclinic: P2<sub>1</sub>/c  
 a 7.49, b 4.33, c 9.85 Å,  $\beta$  110.7°  
 Colourless; vitreous; transparent.  
 Biaxial (-),  $\alpha$  1.691,  $\beta$  1.713,  $\gamma$  1.730,  
 2V(meas.) 80.0°, 2V(calc.) 82°.  
 3.21 (40), 2.61 (40), 2.14 (100), 2.102 (60), 1.625 (100), 1.607 (40), 1.399 (40).

## IMA No. 97-015

A Ca-dominant polymorph of zorite  
 $(\text{Na,Ca})_5\text{Ca}(\text{Ti},\text{Nb})_5\text{Si}_{12}\text{O}_{34}(\text{OH},\text{F})_8 \cdot 5\text{H}_2\text{O}$   
 Orthorhombic: C222  
 a 7.024, b 23.155, c 6.953 Å  
 Pale brown, brown, orange-yellow; vitreous; transparent to translucent.  
 Biaxial (+),  $\alpha$  1.599,  $\beta$  1.610,  $\gamma$  1.696,  
 2V(meas.) 38°, 2V(calc.) 41°.

11.564 (100), 6.932 (90), 5.258 (40), 4.446 (40),  
3.052 (75), 2.977 (70), 2.582 (40).

## IMA No. 97-017

A monoclinic polymorph of cervantite  
 $\text{Sb}_2\text{O}_4$  ( $\text{Sb}^{3+}\text{Sb}^{5+}\text{O}_4$ ,  $\beta$ -phase)  
Monoclinic:  $\text{C}2/\text{c}$   
a 12.061, b 4.836, c 5.383 Å,  $\beta$  104.60°  
Colourless; vitreous; transparent.  
Biaxial (sign unknown),  $\alpha'$  1.72,  $\gamma'$  2.10.  
3.244 (VS), 2.920 (M), 2.877 (S), 1.619 (M).

## IMA No. 97-018

A member of the milarite group  
 $\text{K}(\text{Ca},\text{Mn},\text{Na})_2(\text{K}_{2-\text{x}}\square_{\text{x}})_2\text{Zn}_3\text{Si}_{12}\text{O}_{30}$   
Hexagonal:  $\text{P}6/\text{mmc}$   
a 10.505, c 14.185 Å  
Colourless, white; vitreous; transparent to translucent.  
Uniaxial (+),  $\omega$  1.561,  $\epsilon$  1.562  
7.11 (35), 3.830 (100), 3.345 (60), 3.304 (40),  
2.940 (50), 2.795 (85), 2.627 (35).

## IMA No. 97-019

The zinc-dominant member of the manasseite group  
 $\text{Zn}_4\text{Al}_2(\text{OH})_{12}(\text{CO}_3) \cdot 3\text{H}_2\text{O}$   
Hexagonal:  $\text{P}6_3/\text{mmc}$   
a 3.0725, c 15.1135 Å  
White; vitreous; transparent.  
Optical properties could not be measured.  
7.51 (vs), 3.794 (m), 2.511 (mw), 2.175 (mw),  
1.830 (mw), 1.542 (ms), 1.539 (ms).

## IMA No. 97-021

$\text{HgBi}_2\text{S}_4$   
Monoclinic:  $\text{C}2/\text{m}$   
a 14.164, b 4.053, c 13.967 Å,  $\beta$  118.28°  
Grey-black; metallic; opaque.  
In reflected light: creamy-white, distinct anisotropism, low bireflectance, non-pleochroic.  $R_1$  &  $R_2$ : (35.7, 37.8%) 470 nm, (35.4, 37.5%) 546 nm, (34.9, 37.0%) 589 nm, (33.9, 35.8%) 650 nm.  
3.86 (m), 3.55 (m), 3.05 (S), 2.914 (mS),  
2.865 (mS), 2.644 (m), 1.913 (m), 1.805 (m).

## IMA No. 97-022

The cadmium-dominant analogue of 97-023  
 $(\text{Cd},\text{Ca},\text{Mn})\text{KCu}_5(\text{AsO}_4)_4[\text{As}(\text{OH})_2\text{O}_2](\text{H}_2\text{O})_2$   
Monoclinic:  $\text{P}2_1/\text{m}$   
a 9.8102, b 10.0424, c 9.9788 Å,  $\beta$  101.686°  
Electric blue; vitreous; transparent.  
Biaxial (-),  $\alpha$  1.720,  $\beta$  1.749,  $\gamma$  1.757,  
2V(meas.) 50°, 2V(calc.) 55°.  
9.64 (100), 4.46 (40), 3.145 (50), 3.048 (40),  
2.698 (40).

## IMA No. 97-023

The calcium-dominant analogue of 97-022  
 $(\text{Ca},\text{Cd},\text{Mn})\text{KCu}_5(\text{AsO}_4)_4[\text{As}(\text{OH})_2\text{O}_2](\text{H}_2\text{O})_2$   
Monoclinic:  $\text{P}2_1/\text{m}$   
a 9.8102, b 10.0424, c 9.9788 Å,  $\beta$  101.686°  
Electric blue; vitreous; transparent.  
Biaxial (-),  $\alpha$  1.713,  $\beta$  1.743,  $\gamma$  1.749,  
2V(meas.) 50°, 2V(calc.) 48°.  
9.64 (100), 4.46 (40), 3.145 (50), 3.048 (40),  
2.698 (40).

## IMA No. 97-024

The cadmium-dominant analogue of campigliaite  
 $\text{Cu}_4\text{Cd}(\text{SO}_4)_2(\text{OH})_6 \cdot 4\text{H}_2\text{O}$   
Monoclinic:  $\text{P}2_1/\text{m}$   
a 5.543, b 21.995, c 6.079 Å,  $\beta$  92.04°  
Bluish-green; vitreous; transparent.  
Biaxial (-),  $\alpha$  1.619,  $\beta$  1.642,  $\gamma$  1.661,  
2V(meas.) 66°, 2V(calc.) 83°.  
11.02 (90), 5.496 (100), 5.322 (25), 4.079 (50),  
3.437 (30), 3.243 (40), 2.470 (30).

## IMA No. 97-025

$\text{UO}_2\text{CO}_3 \cdot \text{H}_2\text{O}$   
Hexagonal: space group unknown  
a 15.79, c 23.93 Å  
Canary yellow; silky; translucent.  
Uniaxial (+),  $\omega$  1.588,  $\epsilon$  1.612.  
7.86 (47), 6.91 (55), 6.56 (77), 4.76 (40),  
4.34 (36), 3.39 (33), 3.056 (100).

## IMA No. 97-026

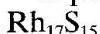
The boron-dominant analogue of vesuvianite  
 $\text{Ca}_{19}(\text{Al},\text{Mg},\text{Fe},\text{Ti})_{13}(\text{B},\text{Al},\square)_5\text{Si}_{18}\text{O}_{68}(\text{O},\text{OH},\text{F})_{10}$   
Tetragonal:  $\text{P}4/\text{nnc}$   
a 15.752, c 11.717 Å  
Dark green; vitreous; translucent.  
Uniaxial (+),  $\omega$  1.721,  $\epsilon$  1.725.  
2.776 (100), 2.617 (61), 2.592 (43), 2.491 (61),  
2.121 (20), 1.660 (26), 1.640 (23).

## IMA No. 97-027

The cobalt-dominant analogue of lothar meyerite  
 $\text{Ca}(\text{Co},\text{Fe},\text{Ni})_2(\text{AsO}_4)_2(\text{OH},\text{H}_2\text{O})_2$   
Monoclinic:  $\text{C}2/\text{m}$   
a 9.024, b 6.230, c 7.421 Å,  $\beta$  115.15°  
Brown; vitreous; translucent.  
Biaxial (+),  $\alpha$  1.78,  $\beta$  1.79,  $\gamma$  1.85(calc.),  
2V(meas.) 48°.  
4.955 (38), 3.398 (85), 3.188 (28), 3.115 (33),  
2.972 (100), 2.709 (28), 2.545 (34).

## IMA No. 97-029

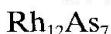
The rhodium- and sulfur-dominant analogue of palladseite



Cubic: Pm $\bar{3}$ m, P43m or P432  
a 10.024 Å

Colour unknown; metallic; opaque.  
In reflected light: grey with slight bluish tint,  
isotropic. R: (38.6%) 480 nm, (39.0%)  
540 nm, (39.1%) 580 nm, (38.8%) 660 nm.  
3.33 (2), 3.17 (7), 3.02 (9), 2.68 (5), 2.24 (9),  
1.931 (8), 1.774 (10).

## IMA No. 97-030



Hexagonal: P6 $_3$ /m  
a 9.31, c 3.64 Å

Colour unknown; metallic; opaque.  
In reflected light: brownish-grey, weak  
anisotropism from grey to brownish-grey,  
weak bireflectance, nonpleochroic. R<sub>min.</sub> &  
R<sub>max.</sub>: (44.5, 47.8%) 480 nm, (44.7, 48.3%)  
540 nm, (46.4, 49.2%) 580 nm,  
(48.6, 51.3%) 660 nm.  
2.33 (4), 2.03 (2), 1.852 (9), 1.767 (6),  
1.755 (10), 1.549 (8).

## IMA No. 97-032

The Fe<sup>2+</sup>-dominant analogue of wallkilldellite  
(Ca,Cu)<sub>4</sub>Fe<sub>6</sub>[{(As,Si)O<sub>4</sub>]<sub>4</sub>(OH)<sub>8</sub> · 18H<sub>2</sub>O

Hexagonal: P6 $_3$ /mmc, P6 $_3$ mc or P62c  
a 6.548, c 23.21 Å

Brown-yellow; vitreous to resinous;  
translucent.

Uniaxial (-), ω 1.750, ε could not be  
determined.

11.6 (100), 5.670 (80), 3.275 (70), 2.850 (10),  
2.760 (15), 2.547 (10), 1.641 (25).

## IMA No. 97-034



Monoclinic: P2 $_1$ /n  
a 6.629, b 7.616, c 7.379 Å, β 91.79°

Dark green; adamantine; translucent.

Biaxial (sign unknown), n 1.94, mineral reacts  
with liquids of n > 1.9.

3.385 (100), 3.315 (78), 2.939 (47), 2.839 (28),  
2.381 (29), 2.331 (29), 1.652 (32), 1.621 (34).

## IMA No. 97-035

A member of the amphibole group  
(K,Na)Ca<sub>2</sub>Fe<sup>2+</sup>Fe<sup>3+</sup>[Si<sub>5</sub>Al<sub>3</sub>O<sub>22</sub>](OH)<sub>2</sub>

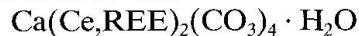
Monoclinic: C2/m  
a 9.94, b 18.08, c 5.38 Å, β 105.5°

Black; vitreous; transparent.

Biaxial (-), α 1.696, β not determined, γ 1.715,  
2V(meas.) 45°.

8.44 (90), 3.405 (25), 3.285 (30), 3.145 (100),  
2.823 (26), 2.722 (52), 2.606 (27), 2.579 (25).

## IMA No. 97-036



Triclinic: P $\bar{1}$

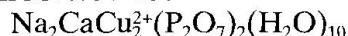
a 6.397, b 6.389, c 12.383 Å,  
α 96.58°, β 100.85°, γ 100.46°

Colourless to white; vitreous; translucent.

Biaxial (-), α 1.635, β 1.725, γ 1.750,  
2V(calc.) 53°.

5.901 (59), 5.049 (72), 4.695 (37), 4.468 (36),  
4.006 (110), 3.899 (45), 3.125 (39),  
3.0051 (448).

## IMA No. 97-037



Orthorhombic: Fdd2

a 11.938, b 32.854, c 11.017 Å

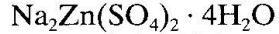
Blue-green; vitreous; transparent.

Biaxial (+), α 1.508, β 1.511, γ 1.517,  
2V(meas.) 76.2°, 2V(calc.) 71°.

8.23 (30), 6.52 (100), 4.05 (40), 3.255 (40),  
2.924 (40), 2.807 (25), 2.614 (20).

## IMA No. 97-041

The zinc-dominant analogue of blödite



Monoclinic: P2 $_1$ /a

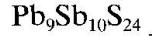
a 11.077, b 8.249, c 5.532 Å, β 100.18°.

Colourless; vitreous; transparent.

Biaxial (-), α 1.507, β 1.512, γ 1.516 (all for  
synthetic material).

4.550 (58), 4.245 (32), 3.325 (25), 3.289 (100),  
3.262 (35), 3.245 (25), 2.631 (27).

## IMA No. 97-042



Triclinic: P $\bar{1}$

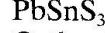
a 24.789, b 8.26, c 21.787 Å, α 90.53°,  
β 99.58°, γ 94.78°.

Black; metallic; opaque.

In reflected light: black, low anisotropism, low  
bireflectance, nonpleochroic. R<sub>1</sub> & R<sub>2</sub>:  
(38.95, 37.64%) 470 nm, (42.35, 38.26%)  
546 nm, (41.67, 37.63%) 589 nm, (37.43,  
36.53%) 650 nm.

3.47 (vs), 3.35 (ms), 3.24 (ms), 2.986 (s),  
2.947 (s), 2.229 (ms).

## IMA No. 97-043



Orthorhombic: Pnma

a 8.8213, b 3.7725, c 14.0053 Å.

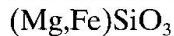
Greyish black; metallic; opaque.

In reflected light: white, weak anisotropism,  
weak bireflectance, nonpleochroic.

$R_1$  &  $R_2$ : (33.9, 36.0%) 470 nm, (31.3, 32.9%) 546 nm, (30.0, 31.4%) 589 nm, (28.8, 29.9%) 650 nm.  
4.128 (100), 3.730 (30), 3.1085 (28), 2.8081 (51), 2.7421 (41), 2.6692 (51), 1.9335 (54).

## IMA No. 97-044

A member of the ilmenite group



Hexagonal (trigonal):  $R\bar{3}$   
a 4.78, c 13.6 Å.

Colourless; vitreous; transparent.

Uniaxial, no other data could be determined.  
3.509 (61), 2.616 (100), 2.366 (52), 2.097 (45),  
1.755 (45), 1.636 (65), 1.366 (50).

## IMA No. 97-045



Monoclinic:  $P2_1$  or  $P2_1/m$   
a 7.5006, b 7.474, c 7.503 Å,  $\beta$  90.847°.  
Pale buff-cream; somewhat greasy; transparent to translucent.  
Almost isotropic (biref. = 0.0009), biaxial  
n 1.359, 2V(meas.) up to 27°.  
4.33 (100), 2.65 (60), 2.25 (70), 2.18 (50),  
2.158 (40), 1.877 (90).

## IMA No. 97-047



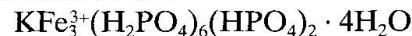
Monoclinic:  $P2$  (pseudo-tetragonal)  
a 4.566, b 13.018, c 4.566 Å,  $\beta$  90.15°.  
White to yellow; vitreous; translucent to transparent.  
Uniaxial (−),  $\omega$  1.540,  $\epsilon$  1.40, 2V(meas.) 0–5°.  
12.97 (10), 6.52 (3), 4.57 (3), 4.32 (5), 3.223 (3),  
3.133 (5), 2.016 (4).

## IMA No. 97-048

The magnesium-dominant analogue of palenzonaite

$NaCa_2Mg_2(VO_4)_3$   
Cubic:  $Ia\bar{3}d$   
a 12.427 Å  
Red; adamantine; transparent.  
Isotropic, n 1.94.  
3.108 (44), 2.779 (100), 2.652 (20), 2.535 (39),  
1.723 (26), 1.662 (40).

## IMA No. 97-049



Monoclinic:  $C2/c$   
a 16.95, b 9.59, c 17.57 Å,  $\beta$  90.85°.

White; vitreous; translucent.  
Biaxial (−),  $\alpha$  1.557,  $\beta$  1.598,  $\gamma$  1.602,  
2V(meas.) 32°, 2V(calc.) 34°.  
8.83 (10), 7.60 (4), 3.75 (10), 3.30 (4), 3.23 (5),  
3.11 (4), 3.02 (9).

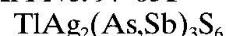
## IMA No. 97-050



Cubic:  $Pa\bar{3}$   
a 12.845 Å

Dark red; adamantine; transparent.  
Isotropic, n > 2.0.  
3.01 (87), 2.790 (100), 2.608 (100), 2.332 (44),  
2.134 (53), 1.510 (99), 1.0020 (35).

## IMA No. 97-051



Orthorhombic:  $Pnmb$  or  $P2_1nb$   
a 12.479, b 15.522, c 5.719 Å.

Dark grey; metallic; opaque.  
In reflected light: pure white, extremely weak  
anisotropism, no bireflectance, non-  
pleochroic.  $R_{min.}$  &  $R_{max.}$ : (31.43, 33.43%)  
470 nm, (28.31, 30.52%) 546 nm,  
(27.10, 29.11%) 589 nm, (25.57, 27.44%)  
650 nm.  
3.655 (16), 3.363 (50), 3.290 (23), 3.210 (26),  
3.118 (27), 2.822 (100), 2.540 (17), 2.070 (15).

## Proposals from previous years approved in 1997

## IMA No. 93-029



Monoclinic:  $P2/a$  (?)  
a 23.88, b 14.40, c 7.238 Å,  $\beta$  91.0°.  
Yellow, pink-yellow or cream; vitreous and  
silky; translucent.  
Biaxial (−),  $\alpha$  1.542,  $\beta$  1.569,  $\gamma$  1.571,  
2V(meas.) 28°, 2V(calc.) 30°.  
12.36 (100), 3.232 (13), 3.190 (29), 3.108 (29),  
3.087 (21), 3.058 (13), 2.708 (12).

## IMA No. 96-016



Orthorhombic:  $Pcmm$ ,  $Pcm2_1$ , or  $Pc2m$   
a 11.215, b 3.124, c 19.21 Å.

Yellowish-white; vitreous or pearly;  
translucent.

Biaxial (−),  $\alpha$  1.532,  $\beta$  ~  $\gamma$  1.562, 2V(meas.)  
≤ 5°.  
11.41 (29), 9.78 (46), 9.60 (38), 4.25 (20),  
3.498 (100).

**IMA No. 96-018**

A member of the tourmaline group  
 $\square(\text{LiAl}_2)\text{Al}_6(\text{BO}_3)_3(\text{Si}_6\text{O}_{18})(\text{OH})_4$   
Hexagonal (trigonal): R3m  
a 15.770, c 7.085 Å.  
Pink; vitreous; translucent.  
Uniaxial (-),  $\omega$  1.645,  $\epsilon$  1.624.  
4.181 (58), 3.950 (100), 3.434 (52), 2.924 (56),  
2.552 (93), 1.898 (72).

**IMA No. 96-061**

An hexagonal or trigonal dimorph of scorodite  
 $\text{Fe}^{3+}\text{AsO}_4 \cdot 2\text{H}_2\text{O}$   
Hexagonal: P-c- (extinction symbol)  
a 8.9327, c 9.9391 Å.  
White to light yellow-brown; vitreous;  
translucent.  
Uniaxial (sign unknown),  $\omega$  and  $\epsilon$  > 1.72.  
4.973 (61), 4.184 (44), 4.076 (100), 3.053 (67),  
2.806 (68), 2.661 (59), 2.520 (54), 2.2891 (44).