

**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  
(Bi,Pb)<sub>2</sub>Fe(O,OH)<sub>3</sub>PO<sub>4</sub>  
Monoclinic: C2/m  
a 12.278, b 3.815, c 6.899 Å, β 111.14°.  
Black to dark brown; vitreous to adamantine; opaque  
to translucent.  
Biaxial (-), α 2.06, β 2.15(calc), γ 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)  
Ca<sub>2</sub>B<sub>2</sub>SiO<sub>7</sub>  
Tetragonal: P4<sub>2</sub>m  
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  
nenadkevichite  
NaK<sub>2</sub>(Ti,Nb)<sub>2</sub>Si<sub>4</sub>O<sub>12</sub>(O,OH)<sub>2</sub>·2H<sub>2</sub>O  
Monoclinic: C2/m  
a 14.39, b 13.900, c 7.825 Å, β 117.6°.  
Colourless; vitreous; transparent to translucent.  
Biaxial (+), α 1.667, β 1.677, γ 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  
AgSbS<sub>2</sub>  
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  
(UO<sub>2</sub>)H(AsO<sub>3</sub>)  
Tetragonal: space group unknown  
a 11.00, c 15.96 Å  
Yellow; dull; translucent.  
Uniaxial (-), ω 1.84, ε 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  
 $(\text{Na}, \text{Ca})_5\text{Ca}(\text{Ti}, \text{Nb})_5\text{Si}_{12}\text{O}_{34}(\text{OH}, \text{F})_8 \cdot 5\text{H}_2\text{O}$   
 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  
 $\text{Sb}_2\text{O}_4$  (Sb<sup>3+</sup>Sb<sup>5+</sup>O<sub>4</sub>,  $\beta$ -phase)  
 Monoclinic: C2/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  
 $\text{K}(\text{Ca}, \text{Mn}, \text{Na})_2(\text{K}_{2-x}\square_x)_2\text{Zn}_3\text{Si}_{12}\text{O}_{30}$   
 Hexagonal: P6/mcc  
 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: P6<sub>3</sub>/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  
 $\text{HgBi}_2\text{S}_4$

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- Monoclinic: C2/m  
a 14.164, b 4.053, c 13.967 Å, β 118.28°  
Grey-black; metallic; opaque.  
In reflected light: creamy-white, distinct anisotropism, low bireflectance, nonpleochroic. R<sub>1</sub> & R<sub>2</sub>: (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).  
2.776 (100), 2.617 (61), 2.592 (43), 2.491 (61), 2.121 (20), 1.660 (26), 1.640 (23).
- IMA No. 97-022 The cadmium-dominant analogue of 97-023  
(Cd,Ca,Mn)KCu<sub>5</sub>(AsO<sub>4</sub>)<sub>4</sub>[As(OH)<sub>2</sub>O<sub>2</sub>](H<sub>2</sub>O)<sub>2</sub>  
Monoclinic: P2<sub>1</sub>/m  
a 9.8102, b 10.0424, c 9.9788 Å, β 101.686°  
Electric blue; vitreous; transparent.  
Biaxial (-), α 1.720, β 1.749, γ 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  
(Ca,Cd,Mn)KCu<sub>5</sub>(AsO<sub>4</sub>)<sub>4</sub>[As(OH)<sub>2</sub>O<sub>2</sub>](H<sub>2</sub>O)<sub>2</sub>  
Monoclinic: P2<sub>1</sub>/m  
a 9.8102, b 10.0424, c 9.9788 Å, β 101.686°  
Electric blue; vitreous; transparent.  
Biaxial (-), α 1.713, β 1.743, γ 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  
Cu<sub>4</sub>Cd(SO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub>·4H<sub>2</sub>O  
Monoclinic: P2<sub>1</sub>/m  
a 5.543, b 21.995, c 6.079 Å, β 92.04°  
Bluish-green; vitreous; transparent.  
Biaxial (-), α 1.619, β 1.642, γ 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  
UO<sub>2</sub> CO<sub>3</sub> ·H<sub>2</sub>O  
Hexagonal: space group unknown  
a 15.79, c 23.93 Å  
Canary yellow; silky; translucent.  
Uniaxial (+), ω 1.588, ε 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  
Ca<sub>19</sub>(Al,Mg,Fe,Ti)<sub>13</sub>(B,Al,□)<sub>5</sub>Si<sub>18</sub>O<sub>68</sub>(O,OH,F)<sub>10</sub>  
Tetragonal: P4/nnc  
a 15.752, c 11.717 Å  
Dark green; vitreous; translucent.  
Uniaxial (+), ω 1.721, ε 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 lotharmeyerite  
Ca(Co,Fe,Ni)<sub>2</sub>(AsO<sub>4</sub>)<sub>2</sub>(OH,H<sub>2</sub>O)<sub>2</sub>  
Monoclinic: C2/m  
a 9.024, b 6.230, c 7.421 Å, β 115.15°.  
Brown; vitreous; translucent.  
Biaxial (+), α 1.78, β 1.79, γ 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  
Rh<sub>17</sub>S<sub>15</sub>  
Cubic: Pm $\bar{3}$ m, P $\bar{4}$ 3m 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  
Rh<sub>12</sub>As<sub>7</sub>  
Hexagonal: P6<sub>3</sub>/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 wallkildellite  
(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<sub>3</sub>/mmc, P6<sub>3</sub>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  
ZnFe<sub>2</sub><sup>3+</sup>(AsO<sub>4</sub>)<sub>2</sub>(OH)<sub>2</sub>  
Monoclinic: P2<sub>1</sub>/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  
 $(K,Na)Ca_2Fe^{2+}Fe_3^{3+}[Si_5Al_3O_{22}](OH)_2$   
 Monoclinic: C2/m  
 a 9.94, b 18.08, c 5.38 Å,  $\beta$  105.5°  
 Black; vitreous; transparent.  
 Biaxial (–),  $\alpha$  1.696,  $\beta$  not determined,  $\gamma$  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  
 $Ca(Ce,REE)_2(CO_3)_4 \cdot H_2O$   
 Triclinic: P  
 a 6.397, b 6.389, c 12.383 Å,  
 $\alpha$  96.58°,  $\beta$  100.85°,  $\gamma$  100.46°  
 Colourless to white; vitreous; translucent.  
 Biaxial (–),  $\alpha$  1.635,  $\beta$  1.725,  $\gamma$  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  
 $Na_2CaCu_2^{2+}(P_2O_7)_2(H_2O)_{10}$   
 Orthorhombic: Fdd2  
 a 11.938, b 32.854, c 11.017 Å  
 Blue-green; vitreous; transparent.  
 Biaxial (+),  $\alpha$  1.508,  $\beta$  1.511,  $\gamma$  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  
 $Na_2Zn(SO_4)_2 \cdot 4H_2O$   
 Monoclinic: P2<sub>1</sub>/a  
 a 11.077, b 8.249, c 5.532 Å,  $\beta$  100.18°.  
 Colourless; vitreous; transparent.  
 Biaxial (–),  $\alpha$  1.507,  $\beta$  1.512,  $\gamma$  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  
 $Pb_9Sb_{10}S_{24}$   
 Triclinic: P1̄  
 a 24.789, b 8.26, c 21.787 Å,  
 $\alpha$  90.53°,  $\beta$  99.58°,  $\gamma$  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  
 $PbSnS_3$   
 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<sub>1</sub> & R<sub>2</sub>: (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  
 $(Mg,Fe)SiO_3$   
 Hexagonal (trigonal): R3̄  
 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  
 $Na_2LiAlF_6$   
 Monoclinic: P2<sub>1</sub> or P2<sub>1</sub>/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).

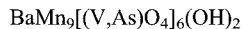
IMA No. 97-047  
 $(Na,Y)(Y,REE)(HCO_3)(OH)_2 \cdot 5H_2O$   
 Monoclinic: P2 (pseudo-tetragonal)  
 a 4.566, b 13.018, c 4.566 Å,  $\beta$  90.15°.  
 White to yellow; vitreous; translucent to transparent.  
 Uniaxial (–),  $\omega$  1.540,  $\epsilon$  1.40, 2V(meas.) 0–5°.  
 12.97 (10), 6.52 (3), 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: Ia3̄d  
 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  
 $KFe_3^{3+}(H_2PO_4)_6(HPO_4)_2 \cdot 4H_2O$   
 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).

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IMA No. 97-050



Cubic:  $\text{Pa}\bar{3}$

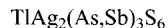
a 12.845 Å

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:  $\text{Pnmb}$  or  $\text{P2}_1\text{nb}$

a 12.479, b 15.522, c 5.719 Å.

Dark grey; metallic; opaque.

In reflected light: pure white, extremely weak anisotropism, no birefractance, nonpleochroic.

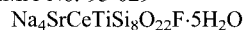
$R_{\text{min.}}$  &  $R_{\text{max.}}$ : (31.43, 33.43 %)470 nm, (28.31, 30.52 %)546 nm,

(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:  $\text{P2/a}$  (?)

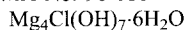
a 23.88, b 14.40, c 7.238 Å,  $\beta$  91.0°.

Yellow. pink-yellow or cream; vitreous and silky; translucent.

Biaxial (–),  $\alpha$  1.542,  $\beta$  1.569,  $\gamma$  1.571,  $2V(\text{meas.})$  28°,  $2V(\text{calc.})$  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:  $\text{Pcmm}$ ,  $\text{Pcm}2_1$ , or  $\text{Pc}2\text{m}$

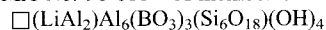
a 11.215, b 3.124, c 19.21 Å.

Yellowish-white; vitreous or pearly; translucent.

Biaxial (–),  $\alpha$  1.532,  $\beta$  –  $\gamma$  1.562,  $2V(\text{meas.}) \leq 5^\circ$ .

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



Hexagonal (trigonal):  $\text{R}\bar{3}\text{m}$

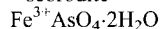
a 15.770, c 7.085 Å.

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



Hexagonal:  $\text{P-c}$  (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).