

# **New minerals recently approved by the Commission on New Minerals and Mineral Names : International Mineralogical 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

## 1995 Proposals

IMA No. 95-001

A member of the crandallite group.

$\text{SrFe}_3^{3+}(\text{PO}_4)_2(\text{OH}, \text{H}_2\text{O})_6$

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

a 7.28, c 16.85 Å

Yellow, brown; vitreous to resinous; transparent to translucent.

Uniaxial (-),  $\omega$  1.872,  $\varepsilon$  1.862

5.88 (10), 3.65 (6), 3.06 (9), 2.96 (5), 2.81 (5),  
2.53 (5), 2.25 (6), 1.969 (5), 1.820 (5).

IMA No. 95-002

The  $\text{Mn}^{2+}$  and (O,F) analogue of paulkerrite.

$(\text{H}_2\text{O}, \text{K})_2\text{Ti}(\text{Mn}^{2+}, \text{Fe}^{2+}, \text{Z}_2(\text{Fe}^{3+}, \text{Ti}^{4+}))_2(\text{PO}_4)_4$

$(\text{O}, \text{F})_2 \cdot 14 \text{H}_2\text{O}$

Orthorhombic: Pbcu

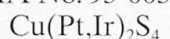
a 10.561, b 20.858, c 12.516 Å

Greenish-yellow, sometimes light brown; vitreous; transparent.

Biaxial (+),  $\alpha$  1.612,  $\beta$  1.621,  $\gamma$  1.649,  
 $2V(\text{calc.}) 59.9^\circ$ .

10.40 (90), 7.50 (80), 6.28 (100), 5.22 (40),  
3.97 (40), 3.77 (50), 3.13 (100), 2.88 (40).

## IMA No. 95-003



Cubic: Fd3m

a 9.940 Å

Steel grey; metallic; opaque.

In reflected light: white with greenish tint, isotropic, no bireflectance or pleochroism.

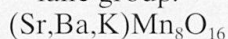
R: (37.3%) 470 nm, (37.7%) 546 nm, (38.1%) 589 nm, (38.6%) 650 nm.

5.72 (4), 2.98 (6), 2.48 (5), 1.90 (7), 1.75 (10), 1.29 (5), 1.014 (5).

2.63 (10), 2.53 (8), 1.942 (10), 1.730 (4), 1.640 (4), 1.3963 (4), 1.1182 (8).

## IMA No. 95-005

The strontium end-member of the cryptomelane group.

Monoclinic: P2<sub>1</sub>/n

a 10.00, b 5.758, c 9.88 Å, β 90.64°

Black; submetallic; opaque.

In reflected light: grey, strong anisotropism, grey-blue to white bireflectance, pleochroism strong. R<sub>max.</sub> & R<sub>min.</sub>:

(34.2, 26.0%) 470 nm, (31.7, 24.4%) 546 nm, (30.6, 23.4%) 589 nm, (27.9, 22.3%) 650 nm.

3.15 (100), 3.13 (80), 2.409 (80), 2.229 (40), 2.170 (60), 2.170 (60), 1.556 (50).

## IMA No. 95-009

The natural analogue of synthetic PtSe<sub>2</sub>. PtSe<sub>2</sub>

Hexagonal (trigonal): P3̄m1

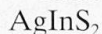
a 3.730, c 5.024 Å

Silvery lead grey; metallic; opaque.

In reflected light: white; anisotropism moderate to strong with tints from pinkish-yellow to dark-grey-lilac; strong bireflectance; pleochroism: R<sub>max.</sub> light-yellow, R<sub>min.</sub> light-lilac. R<sub>max.</sub> & R<sub>min.</sub>: (48.4, 35.1%) 470 nm, (48.3, 35.0%) 546 nm, (49.1, 35.3%) 589 nm, (50.8, 36.5%) 650 nm. 5.04 (3), 2.72 (10), 1.983 (5), 1.859 (5), 1.747 (3), 1.360 (4).

## IMA No. 95-006

The silver analogue of roquesite in the chalcopyrite group.



Tetragonal: 14̄2d

a 5.880, c 11.21 Å

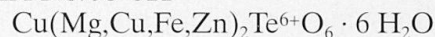
Havana brown; metallic; opaque.

In reflected light: brownish grey; abundant red internal reflections; strong anisotropism in oil from red brick with orange tint to bluish-grey and purplish; pleochroism weak, brown to clear brown-grey in oil.

R<sub>max.</sub> & R<sub>min.</sub>: (29.3, 27.8%) 460 nm, (27.5, 25.9%) 540 nm, (27.65, 25.6%) 580 nm, (27.4, 27.5%) 660 nm.

3.351 (100), 2.941 (80), 2.082 (75), 2.030 (75), 1.767 (80), 1.188 (40).

## IMA No. 95-011



Hexagonal (trigonal): P3

a 5.305, c 9.693 Å

Pale yellow to pale orange-yellow; vitreous; transparent to somewhat translucent.

Uniaxial (-), ω 1.803, ε 1.581 (calc.).

9.70 (100), 4.834 (80), 4.604 (60), 2.655 (60), 2.556 (70), 2.326 (70), 1.789 (40).

## IMA No. 95-012



Triclinic: P1̄

a 6.020, b 7.632, c 11.168 Å, α 74.43°, β 89.32°, γ 86.55°

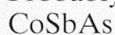
Turquoise blue; vitreous; transparent.

Biaxial (-), α 1.615, β 1.660, γ 1.700, 2V (meas.) 82°, 2V (calc.) 84°.

7.35 (100), 5.239 (50), 4.440 (60), 3.936 (60), 3.302 (40), 3.008 (50), 2.840 (35).

## IMA No. 95-007

Probably belongs to the marcasite group.



Orthorhombic: space group unknown

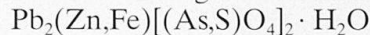
a 3.304, b 6.092, c 10.26 Å

White; metallic; opaque.

In reflected light: silver-white, weak to distinct anisotropism, weak bireflectance, non-pleochroic. R<sub>2</sub> & R<sub>1</sub>: (58.2, 55.5%) 470 nm, (56.8, 55.6%) 546 nm, (55.8, 55.5%) 589 nm, (55.0, 55.5%) 650 nm.

## IMA No. 95-013

The zinc analogue of arsenbrackebuschite.

Monoclinic: P2<sub>1</sub> or P2<sub>1</sub>/m

a 8.973, b 5.955, c 7.766 Å, β 112.20°

Pale olive green with streaks of white; adamantine; transparent.

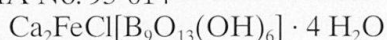
In reflected light: pale brownish grey; abundant colourless to very pale yellow internal reflections; anisotropism not detectable by eye; bireflectance measurable but not noticeable by the eye; nonpleochroic.

R<sub>min.</sub> & R<sub>max.</sub>: (11.2, 11.5%) 470 nm, (10.8, 10.9%) 546 nm, (10.7, 10.8%) 589 nm, (10.7, 10.8%) 650 nm.

4.85 (50), 3.659 (30), 3.246 (100), 2.988 (60), 2.769 (60), 2.293 (30), 2.107 (50), 1.889 (30).



## IMA No. 95-014

Monoclinic:  $P2_1$ a 11.64, b 9.38, c 8.735 Å,  $\beta$  98.40°

Pale yellow; vitreous; transparent.

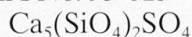
Biaxial ( $\pm$ ),  $\alpha$  1.550,  $\beta$  1.554,  $\gamma$  1.592,

2V(meas.) 36.6°, 2V(calc.) 32.6°.

8.65 (3), 7.29 (10), 5.32 (2), 4.50 (2), 2.958 (3),

2.744 (2), 2.113 (3).

## IMA No. 95-015

Orthorhombic:  $Pnma$ 

a 6.863, b 15.387, c 10.181 Å

Bright blue; vitreous; transparent.

Biaxial ( $-$ ),  $\alpha$  1.630,  $\beta$  1.637,  $\gamma$  1.640, 2V(meas.)

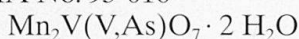
63.3°, 2V(calc.) 66.2°.

3.198 (27), 3.042 (32), 2.853 (40), 2.830 (100),

2.617 (32), 2.565 (57), 1.9612 (26),

1.8924 (27).

## IMA No. 95-016

Monoclinic:  $P2_1/n$ a 7.809, b 14.554, c 6.705 Å,  $\beta$  93.25°

Orange-red; vitreous; transparent.

Biaxial mean n 1.82, 2V small.

5.32 (80), 3.436 (50), 3.260 (50), 3.039 (100),

2.723 (60), 2.573 (50b), 2.441 (50), 1.592 (60).

## IMA No. 95-017

The natural analogue of synthetic  $\text{FeNb}_3\text{S}_6$ .Hexagonal:  $P6_322$ 

a 5.771, c 12.190 Å

Dark grey to black; metallic; opaque.

In reflected light: grey; distinct to strong

anisotropism from blue-grey to dark-brown;

distinct bireflectance; pleochroism, light-

grey to grey.  $R_{\text{max}}$  &  $R_{\text{min}}$ :

(36.3, 29.5%) 470 nm, (36.6, 29.4%) 546 nm,

(36.1, 28.9%) 589 nm, (34.7, 28.1%) 650 nm.

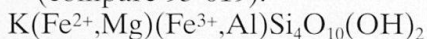
6.11 (8), 3.04 (6), 2.88 (5), 2.606 (8), 2.096 (10),

1.665 (8), 1.524 (6).

## IMA No. 95-018

A member of the mica group

(compare 95-019).

Monoclinic:  $C2/m$ a 5.270, b 9.106, c 10.125 Å,  $\beta$  100.27°

Blue green; earthy; translucent in thin section.

Complete optical data could not be measured,

mean n 1.640.

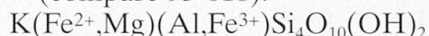
3.65 (52), 3.358 (86), 3.321 (100), 3.090 (60),

2.584 (50).

## IMA No. 95-019

A member of the mica group

(compare 95-018).

Monoclinic:  $C2/m$ a 5.270, b 9.106, c 10.125 Å,  $\beta$  100.27°

Blue green; earthy; translucent in thin section.

Complete optical data could not be measured,

mean n 1.625.

3.65 (52), 3.358 (86), 3.321 (100), 3.090 (60),

2.584 (50).

NOTE: The minerals represented by 95-018

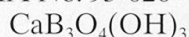
and 95-019 occur intimately mixed, have the

same unit cell parameters, and give the same

X-ray powder diffraction data. They differ in

chemical composition.

## IMA No. 95-020

Monoclinic:  $Pc$ a 7.234, b 8.130, c 8.378 Å,  $\beta$  98.22°

Colourless to white; vitreous; transparent to

translucent.

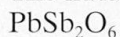
Biaxial ( $-$ ),  $\alpha$  1.580,  $\beta$  1.605,  $\gamma$  1.623,

2V(meas.) 63°, 2V(calc.) 80°.

4.30 (64), 3.379 (100), 3.169 (25), 3.122 (31),

2.151 (20), 1.919 (20), 1.846 (45).

## IMA No. 95-021

The natural analogue of synthetic  $\text{PbSb}_2\text{O}_6$ .Hexagonal (trigonal):  $P31m$ 

a 5.295, c 5.372 Å

Colourless to pale yellow; resinous;

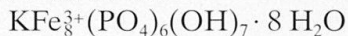
transparent.

Uniaxial ( $-$ ),  $\omega$  2.092,  $\varepsilon$  1.920.

3.49 (VS), 2.648 (M), 2.110 (W), 1.887 (W),

1.651 (W), 1.531 (W).

## IMA No. 95-022

Monoclinic:  $C2$ ,  $Cm$  or  $C2/m$ a 29.52, b 5.249, c 18.56 Å,  $\beta$  109.27°

Yellowish brown, pale yellow, cream to white;

vitreous to silky; translucent.

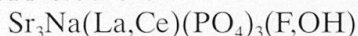
Biaxial (+),  $\alpha$  1.780,  $\beta$  1.785,  $\gamma$  1.800,

2V(calc.) 60°.

9.41 (60), 4.84 (90), 4.32 (70), 4.25 (50), 3.470

(60), 3.216 (100), 3.116 (80).

## MA No. 95-023

Hexagonal (trigonal):  $P3$ 

a 9.647(1), c 7.170(1) Å

Bright yellow to greenish-yellow; vitreous; transparent.  
Uniaxial (-),  $\omega$  1.653,  $\varepsilon$  1.635.  
3.59 (87), 3.30 (65), 3.17 (32), 2.897 (100),  
2.884 (100), 2.790 (54), 1.910 (36), 1.796 (36).

## IMA No. 95-024

The cubic polymorph of lueshite and natro-niobite.  
NaNbO<sub>3</sub>  
Cubic: Pm $\bar{3}$  or P23  
a 3.911 Å  
Brownish-black; adamantine; opaque.  
In reflected light: bluish; reddish-brown  
internal reflections; isotropic; nonpleochroic.  
R: (15.75%) 480 nm, (15.00%) 540 nm,  
(14.70%) 580 nm, (14.35%) 660 nm.  
3.915 (35), 2.765 (100), 1.953 (53), 1.747 (8),  
1.594 (30), 1.380 (22), 1.234 (7).

## IMA No. 95-025

[Zn<sub>8-x</sub>Al<sub>x</sub>(OH)<sub>16</sub>][(SO<sub>4</sub>)<sub>x/2+y/2</sub>Na<sub>y</sub>(H<sub>2</sub>O)<sub>6</sub>]  
Hexagonal (trigonal): P $\bar{3}$   
a 3.082, c 11.116 Å  
Pale blue; vitreous to waxy, translucent.  
Uniaxial (sign unknown),  $\omega$  1.532,  $\varepsilon$  unknown.  
11.12 (100), 5.549 (24), 3.704 (15), 2.595 (6),  
2.408 (6), 2.167 (4), 1.926 (4).

## IMA No. 95-026

A member of the zeolite group.  
NaCaAl<sub>3</sub>Si<sub>17</sub>O<sub>40</sub> · 7 H<sub>2</sub>O  
Orthorhombic: Cmc  
a 9.747, b 23.880, c 20.068 Å  
Colourless; vitreous; transparent.  
Biaxial (+),  $\alpha$  1.476,  $\beta$  1.478,  $\gamma$  1.483,  
2V(meas.) 65°, 2V(calc.) 65°.  
11.94 (40), 9.04 (33), 8.23 (29), 7.69 (29),  
3.79 (100), 3.61 (40).

## IMA No. 95-027

Cu<sub>5</sub>(VO<sub>4</sub>)<sub>2</sub>O<sub>2</sub> · n (Cs,Rb,K)Cl  
Hexagonal (trigonal): P3  
a 6.375, c 8.399 Å  
Black; resinous-metallic; opaque.  
Reflectance measurements could not be made  
because the material is too fine grained.  
3.43 (7), 2.810 (4), 2.315 (10), 2.131 (3),  
1.598 (4).

## IMA No. 95-028

An hexagonal polymorph of alabandite.  
MnS  
Hexagonal: P6<sub>3</sub>mc  
a 3.9817, c 6.4447 Å  
Dark brown to black; resinous; opaque.  
In reflected light: steel-grey; brown-red

internal reflections; anisotropism, 2.62 to  
2.77; bireflectance, 0.15; nopleochroic.  
R<sub>max</sub> & R<sub>min</sub>: (24.5, 22.1%) 470 nm,  
(22.6, 20.5%) 546 nm, (22.1, 20.0%) 589 nm,  
(21.6, 19.6%) 650 nm.  
3.445 (89), 3.217 (72), 3.036 (66), 1.988 (82),  
1.820 (100), 1.691 (63).

## IMA No. 95-029

The Mn-analogue of berthierite.  
MnSb<sub>2</sub>S<sub>4</sub>  
Orthorhombic: Pnam  
a 11.47, b 14.36, c 3.81 Å  
Black; submetallic; opaque.  
In reflected light: light grey; distinct anisotro-  
pism; faint bireflectance; nonpleochroic.  
R<sub>max</sub> & R<sub>min</sub>: (35.0, 24.0%) 470 nm,  
(36.1, 23.9%) 546 nm, (36.9, 24.9%) 589 nm,  
(35.6, 25.7%) 650 nm.  
4.46 (40), 3.69 (90), 3.23 (70), 3.05 (40),  
2.90 (80), 2.65 (100), 2.18 (40), 1.906 (40),  
1.813 (50).

## IMA No. 95-030

Zn<sub>3</sub>Cu<sub>2</sub>(SO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub> · 4 H<sub>2</sub>O  
Triclinic: P $\bar{1}$   
a 5.415, b 6.338, c 10.475 Å,  $\alpha$  94.38°,  
 $\beta$  90.08°,  $\gamma$  90.24°  
Greenish blue; vitreous; transparent.  
Biaxial (+),  $\alpha$  1.629,  $\beta$  1.630,  $\gamma$  1.637,  
2V(meas.) 60°, 2V(calc.) 42°.  
10.459 (61), 5.230 (74), 3.486 (40), 3.157 (6),  
2.728 (6), 2.493 (7), 2.355 (7), 1.743 (9).

## IMA No. 95-031

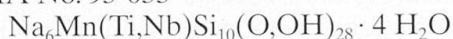
(K,Na)<sub>2</sub>(Nb,Ti)<sub>2</sub>Si<sub>4</sub>O<sub>12</sub>(O,OH)<sub>2</sub> · 4 H<sub>2</sub>O  
Monoclinic: Cm  
a 14.692, b 14.164, c 7.859 Å,  $\beta$  117.87°  
White; vitreous; translucent.  
Biaxial (+),  $\alpha$  1.649,  $\beta$  1.655,  $\gamma$  1.759,  
2V(meas.) 20°, 2V(calc.) 28°.  
7.10 (9), 4.98 (6), 3.262 (10), 3.151 (8b),  
2.956 (6), 2.549 (4), 1.723 (4), 1.591 (4b),  
1.451 (4b).

## IMA No. 95-032

(Fe,Os,Ru,Ir)  
Hexagonal: P6<sub>3</sub>/mmc  
a 2.591, c 4.168 Å  
Megascopic colour unknown; metallic;  
opaque.  
In reflected light: white; weak anisotropism.  
R: (57.4%) 470 nm, (53.4%) 546 nm,  
(53.3%) 589 nm, (54.4%) 650 nm.  
2.246 (5), 2.087 (6), 1.976 (10), 1.297 (6b),  
1.180 (6b), 1.100 (5b).



## IMA No. 95-033



Monoclinic: I2/m

a 13.033, b 18.717, c 12.264 Å,  $\beta$  99.62°

Yellow, pinkish-yellow or pink; vitreous to greasy; translucent to transparent.

Biaxial (-),  $\alpha$  1.536,  $\beta$  1.545,  $\gamma$  1.553,  
2V(meas.) 87°, 2V(calc.) 86°.

10.56 (100), 6.38 (50), 5.55 (45), 4.78 (40), 4.253 (40), 3.196 (80), 2.608 (50).

## IMA No. 95-034



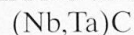
Hexagonal (trigonal): R32

a 10.696, c 15.728 Å

Colourless; vitreous; transparent or cloudy.

Uniaxial (-),  $\omega$  1.612,  $\varepsilon$  1.607.5.99 (60), 3.21 (100), 3.093 (40), 2.990 (85),  
2.61 (40), 1.998 (55), 1.481 (44b).

## IMA No. 95-035

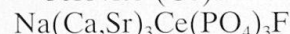
Cubic: Fm $\bar{3}$ m

a 4.45 Å

Bronze-yellow; metallic; opaque.

In reflected light: yellowish- to rose-cream;  
no anisotropism, bireflectance or pleochroism. R: (33.9%) 480 nm, (38.5%) 540 nm,  
(45.1%) 580 nm, (52.8%) 660 nm.2.56 (10), 2.22 (9), 1.574 (8), 1.343 (8), 1.289 (7),  
1.115 (3).

## IMA No. 95-036

The calcium-dominant analogue of  
belovite-(Ce).

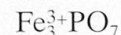
Hexagonal (trigonal): P3

a 9.51, c 7.01 Å

Bright yellow; vitreous; transparent.

Uniaxial (-),  $\omega$  1.682,  $\varepsilon$  1.660.3.51 (30), 3.12 (40), 2.84 (100b), 2.753 (40),  
1.967 (30), 1.870 (30).

## IMA No. 95-037

The natural analogue of synthetic Fe<sup>3+</sup>PO<sub>7</sub>.

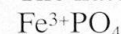
Hexagonal (trigonal): R3m

a 7.994, c 6.855 Å

Brown to red brown; greasy; non-translucent.

Optical data could not be obtained because of  
the small size of the domains.4.86 (10), 3.09 (100), 2.446 (16), 2.078 (20),  
1.997 (13), 1.845 (11), 1.623 (23), 1.545 (12),  
1.440 (16).

## IMA No. 95-038

The natural analogue of synthetic Fe<sup>3+</sup>PO<sub>4</sub>.Hexagonal (trigonal): P3<sub>1</sub>21

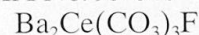
a 5.048, c 11.215 Å

Brown to red-brown; greasy; non-translucent.  
Optical data could not be obtained because of  
the small size of the domains.4.360 (19), 3.445 (100), 2.518 (7), 2.362 (14),  
2.298 (7), 2.180 (10), 1.8846 (12), 1.5814 (8),  
1.4214 (10).

## IMA No. 95-039

Triclinic: P1 or P $\bar{1}$ a 8.794, b 9.996, c 5.660 Å,  $\alpha$  104.10°, $\beta$  90.07°,  $\gamma$  96.34°Pale blue to deeper blue-green; vitreous to  
pearly; transparent to translucent.In reflected light: very pale light brown;  
light emerald green internal reflections;  
anisotropism unknown; slight bireflectance.  
R values could not be measured with  
certainty.9.638 (100), 8.736 (50), 4.841 (100), 2.747 (60),  
2.600 (45).

## IMA No. 95-040

Monoclinic: P2<sub>1</sub>/m or P2<sub>1</sub>a 13.396, b 5.067, c 6.701 Å,  $\beta$  106.58°

Yellow; vitreous; transparent.

Biaxial (-),  $\alpha$  1.584,  $\beta$  1.724,  $\gamma$  1.728,  
2V(meas.) 16°, 2V(calc.) 18°.4.000 (10), 3.269 (100), 2.535 (20), 2.140 (40),  
2.003 (40), 1.635 (10), 1.373 (10).

## IMA No. 95-041

Cubic: Fm $\bar{3}$ m, F4 $\bar{3}$ 2 or F4 $\bar{3}$ m

a 6.364 Å

Bright white; metallic; opaque.

In reflected light: bright white with yellowish  
tint; no anisotropism, bireflectance or  
pleochroism. R: (49.3%) 470 nm,  
(60.6%) 550 nm, (68.5%) 590 nm,  
(80.1%) 650 nm.2.25 (100), 1.92 (60), 1.59 (60), 1.299 (80),  
1.125 (60), 1.076 (60), 1.006 (60).

## IMA No. 95-042

Cubic: Pm $\bar{3}$ m

a 3.988 Å

Bright white; metallic; opaque.

In reflected light: bright white with yellowish  
tint; no anisotropism, bireflectance or  
pleochroism. R: (56.1%) 470 nm,  
(62.5%) 550 nm, (65.7%) 590 nm,  
(71.3%) 650 nm.

2.30 (100), 1.99 (60), 1.411 (40), 1.203 (80),  
1.151 (40), 0.997 (20).

IMA No. 95-043

$\text{Fe}_2(\text{Ta}, \text{Nb})$

Hexagonal:  $\text{P6}_3/\text{mmc}$ ,  $\text{P6}_3/\text{mc}$  or  $\text{P}\bar{6}2\text{c}$   
a 4.87, c 7.76 Å

Greyish-yellow; metallic; opaque.

In reflected light: greyish white;

no anisotropism, bireflectance or pleochroism. R: (55.4%) 460 nm, (60.8%) 540 nm,  
(65.7%) 590 nm, (71.3%) 660 nm.

2.84 (7), 2.46 (6), 2.22 (9), 2.00 (3), 1.92 (4),  
1.41 (3), 1.34 (8).

IMA No. 95-044

The natural analogue of synthetic  $\text{Bi}_{16}\text{CrO}_{27}$ .

$\text{Bi}_{16}\text{CrO}_{27}$

Tetragonal:  $\text{I4}$ ,  $\text{I}\bar{4}$  or  $\text{I4/m}$

a 8.649, c 17.24 Å

Orange-brown; adamantine; translucent.

Uniaxial (+),  $\omega$  2.50,  $\varepsilon$  2.55.

In reflected light: greyish white to light orange;

orange internal reflections; weak anisotropism; weak bireflectance; very weak pleochroism.  $R_E$  &  $R_O$ : (21.46, 19.40%)  
470 nm, (27.46, 25.22%) 546 nm,  
(29.80, 26.22%) 589 nm, (29.98, 25.96%)  
650 nm.

3.19 (100), 2.730 (40), 1.980 (40), 1.715 (30),  
1.655 (55), 1.124 (25), 1.054 (25).

IMA No. 95-045

A member of the amphibole group.

$\text{Li}_2(\text{Mg}, \text{Fe}^{2+})_3\text{Fe}_2^{3+}\text{Si}_8\text{O}_{22}(\text{OH})_2$

Monoclinic:  $\text{C2/m}$

a 9.474, b 17.858, c 5.268 Å,  $\beta$  101.88°

Black; vitreous; translucent.

Biaxial (+),  $\alpha$  1.699,  $\beta$  1.703,  $\gamma$  1.708,  
2V(meas.) 72°, 2V(calc.) 84°.

8.222 (61), 4.458 (19), 3.044 (100), 2.741 (53),  
2.712 (14), 2.341 (14), 1.433 (46), 1.392 (14).

IMA No. 95-046

$\text{Na}_2(\text{Sr}, \text{Ba})_{14}\text{Na}_2\text{Al}_{12}\text{F}_{64}(\text{F}, \text{OH})_4$

Monoclinic:  $\text{C2/m}$

a 16.046, b 10.971, c 7.281 Å,  $\beta$  101.734°

Colourless to white; vitreous; translucent.

Biaxial (-),  $\alpha$  1.436,  $\beta$  1.442,  $\gamma$  1.442,  
2V(meas.) 0–5°, 2V(calc.) 0°.

7.844 (8), 3.643 (9), 3.453 (10), 3.193 (10),  
3.112 (9), 2.989 (9), 2.220 (8), 2.173 (9),  
2.001 (8).

IMA No. 95-047

$\text{IrBiS}$

Cubic:  $\text{P2}_1\text{3}$

a 6.164 Å

Steel black; metallic; opaque.

In reflected light: bright white with yellowish tint, isotropic. R: (46.2%) 470 nm,  
(47.2%) 550 nm, (47.6%) 590 nm,  
(47.4%) 650 nm.

2.75 (70), 2.51 (60), 1.860 (100), 1.090 (50),  
1.090 (50).

IMA No. 95-048

A polymorph of geminite.

$\text{Cu}^{2+}(\text{AsO}_3\text{OH}) \cdot \text{H}_2\text{O}$

Triclinic:  $\text{P1}$  or  $\text{P}\bar{1}$

a 6.435, b 11.257, c 18.662 Å,  $\alpha$  79.40°,  
 $\beta$  86.48°,  $\gamma$  83.59°

Very light green to colourless; vitreous;  
transparent.

Biaxial (+),  $\alpha$  1.602,  $\beta$  1.642,  $\gamma$  1.725,  
2V(meas.) 70°, 2V(calc.) 73°.

18.3 (25), 11.00 (100), 3.171 (30), 2.952 (50),  
2.920 (60), 2.816 (50), 2.492 (25).

IMA No. 95-049

The Pt-dominant analogue of taimyrite.

$(\text{Pt}, \text{Pd}, \text{Cu})_9\text{Cu}_3\text{Sn}_4$

Orthorhombic:  $\text{Pmmm}$ ,  $\text{Pmm2}$  or  $\text{P222}$

a 7.89, b 4.07, c 7.73 Å

Pinkish lilac; metallic; opaque.

In reflected light: pinkish lilac, distinct

to moderate anisotropism, weak to distinct bireflectance, pleochroic from brownish pink to pinkish lilac.  $R_{\text{max}}$  &  $R_{\text{min}}$ : (44.1,  
42.8%) 470 nm, (50.0, 49.5%) 546 nm,  
(54.6, 51.8%) 589 nm, (56.8, 55.6%) 650 nm.

2.283 (10), 2.163 (4), 2.030 (2), 1.369 (3),  
1.218 (2), 1.143 (2).

IMA No. 95-050

The vanadium analogue of atelestite.

$\text{Bi}_2\text{O}(\text{OH})\text{VO}_4$

Monoclinic:  $\text{P2}_1/\text{c}$

a 6.973, b 7.539, c 10.881 Å,  $\beta$  107.00°

Light brown; adamantine; transparent  
to translucent.

Biaxial (+),  $\alpha$  2.26,  $\beta$  2.27,  $\gamma$  2.30,  
2V(meas.) 65°, 2V(calc.) 61°.

6.667 (23), 6.102 (22), 4.279 (38), 3.267 (100+),  
3.150 (62), 2.734 (36), 2.549 (21), 1.889 (21).

IMA No. 95-051

A member of the zeolite group.

$\text{Ca}_4(\text{Ca}, \text{Sr}, \text{K}, \text{Ba})_3\text{Cu}_3\text{Al}_{12}\text{Si}_{12}\text{O}_{48}(\text{OH})_8 \cdot \sim \text{H}_2\text{O}$

Cubic:  $\text{Fm}\bar{3}\text{m}$

a 31.62 Å

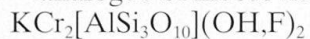
Light blue; vitreous; transparent.

Isotropic: n 1.505.

8.34 (100), 15.82 (50), 9.69 (5), 4.43 (5), 3.87 (5),  
3.47 (5).

## IMA No. 95-052

A member of the mica group; the Cr-dominant analogue of muscovite.



Monoclinic: C2/c

a 5.32, b 9.07, c 20.20 Å,  $\beta$  95.6°

Emerald green; vitreous; transparent.

Biaxial (-),  $\alpha$  1.619,  $\beta$  1.669,  $\gamma$  1.673,

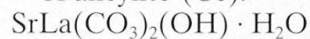
2V(meas.) 31°, 2V(calc.) 31°.

9.94 (6), 4.52 (8), 2.60 (10), 2.40 (6), 2.15 (6),

1.519 (10).

## IMA No. 95-053

The lanthanum-dominant analogue of ancylite-(Ce).



Orthorhombic: Pmcn

a 5.072, b 8.589, c 7.276 Å

Light yellow to yellowish brown; vitreous; transparent.

Biaxial (+),  $\alpha$  1.640,  $\beta$  1.668 (calc.),  $\gamma$  1.731,

2V(meas.) 70°.

4.36 (92), 3.738 (88), 3.705 (90), 2.955 (100),

2.664 (89), 2.358 (87), 2.092 (80).