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Hexagonal System

Beryl/Hexagonal Class

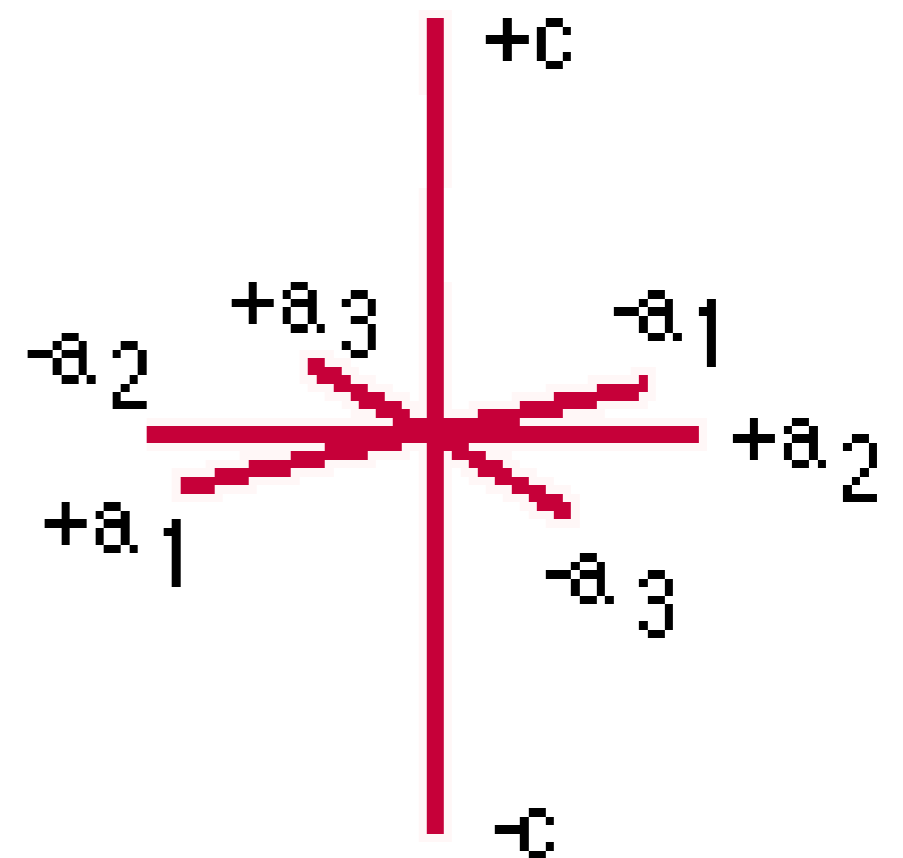
The forms of the hexagonal system are defined by the axial cross relationships. The hexagonal axes consist of 4 axes, 3 of which are of equal length and in the same plane.

These 3 axes, labeled a_1 , a_2 , and a_3 have an angular relationship to each other of 120° (between the + ends).

At right angle to the plane of the a axes is the c axis. Its length may vary from less than to greater than the length of any of the a axes. It will not equal the length of an a axis.

The Hexagonal System is divided into two classes:

1. Hexagonal Class
2. Trigonal Class



Hexagonal Class (aka Beryl Class)

Planes: 4 axial (1 horizontal, 3 vertical)
3 diagonal

Axes: 7 (6 ⁱⁱ, 1 ^{vi})

Trigonal Class (aka Calcite Class)

Planes: 3 diagonal

Axes: 4 (3 ⁱⁱ, 1 ⁱⁱⁱ)

Hexagonal Class (aka Beryl Class)

Forms:

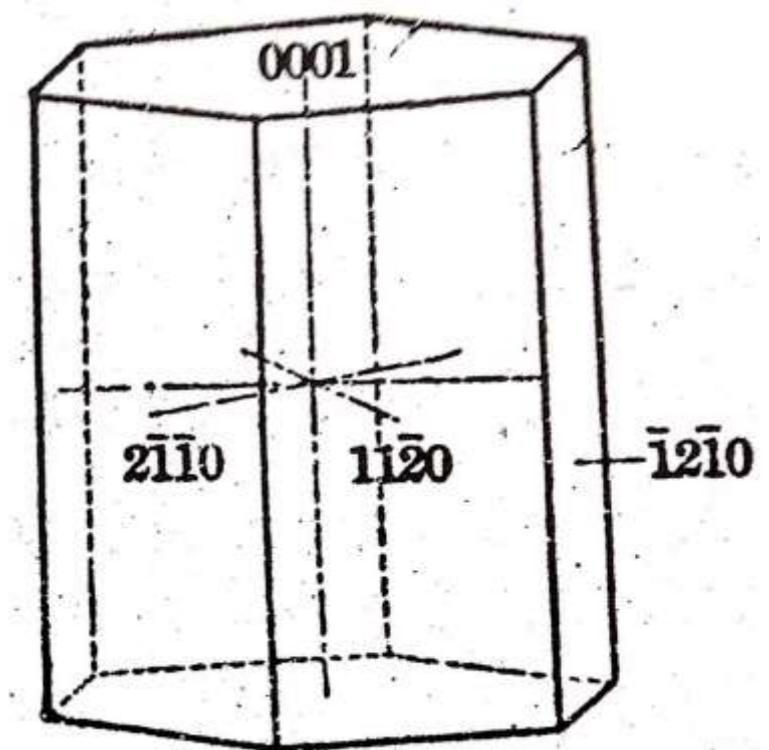
1. Basal Pinacoid (0001)
2. Hexagonal Prism of Second Order $(11\bar{2}0)$
3. Hexagonal Prism of First Order $(10\bar{1}0)$
4. Dihexagonal Prism $(h\bar{k}0)$
5. Hexagonal Bipyramid of Second Order $(hh\bar{2}hl)$
6. Hexagonal Bipyramid of First Order $(h0\bar{h}l)$
7. Dihexagonal Bipyramid $(hk\bar{l})$

Basal Pinacoid

- 2 faces
- Open form
- Intersects the c axis while parallel to the three horizontal axes
- Symbol: (0001) , $(000\bar{1})$

Hexagonal Prism of Second Order

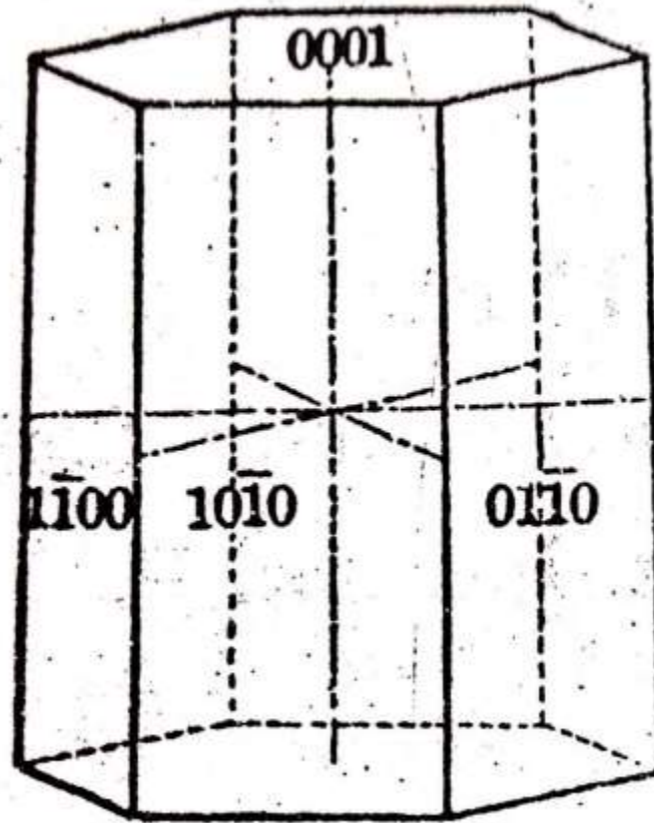
- 6 faces
- Open form
- Horizontal crystallographic axes joining the centres of opposite faces
- Each face parallel to the vertical axis, and cuts all the three horizontal axes, one at unit distance, while other two at twice this distance
- Symbol: $(11\bar{2}0)$



Basal Pinacoid & Prism of Second Order

Hexagonal Prism of First Order

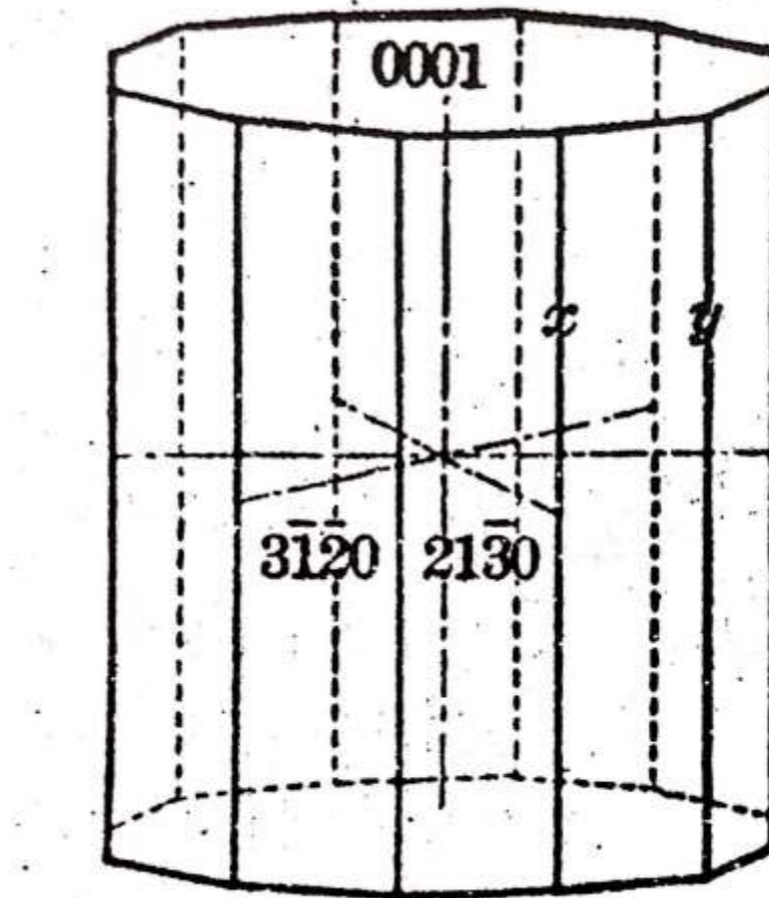
- 6 faces
- Open form
- Horizontal crystallographic axes emerge at the centres of vertical edges
- Each face parallel to the vertical axis and one horizontal axis, and meets the other two horizontal axes at equal distance
- Symbol: $(10\bar{1}0)$



Basal Pinacoid & Prism of First Order

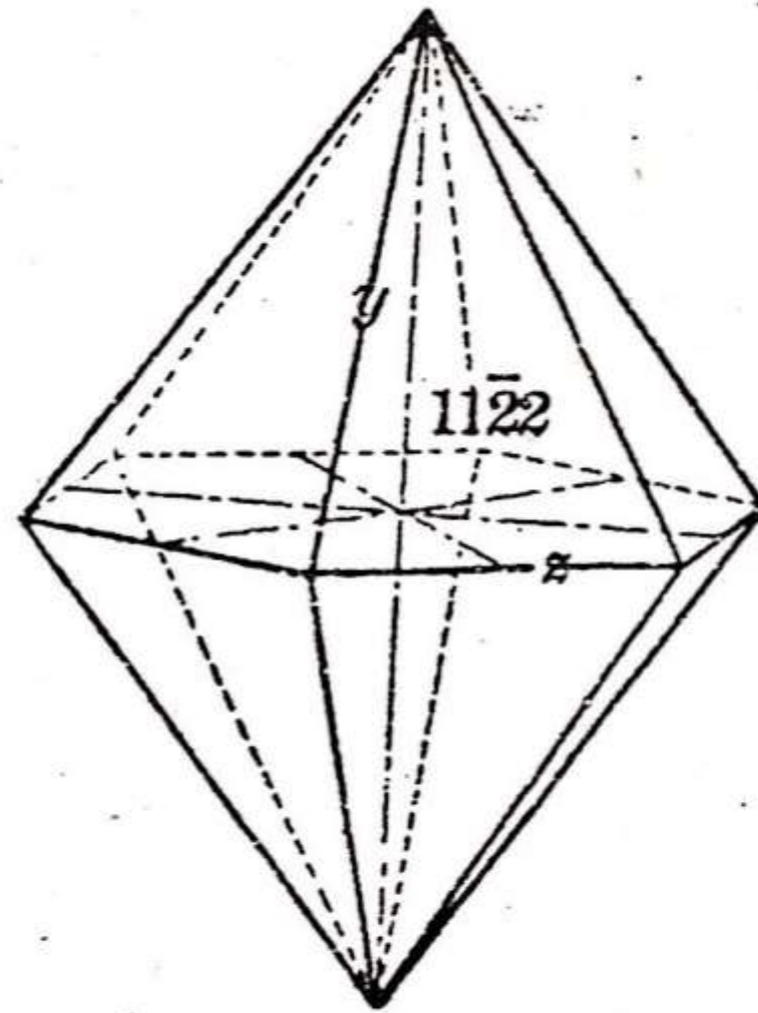
Dihexagonal Prism

- 12 faces
- Open form
- Each face parallel to the vertical axis and cuts the three horizontal axes at different lengths
- Symbol: $(hik0)$



Hexagonal Bipyramid of Second Order

- 12 faces
- Closed form
- Each face cuts the vertical axis and all the horizontal axes, one at unit distance and other two at twice this distance.
- Symbol: $(hh\bar{2}hl)$



Second Order Pyramid

Hexagonal Bipyramid of First Order

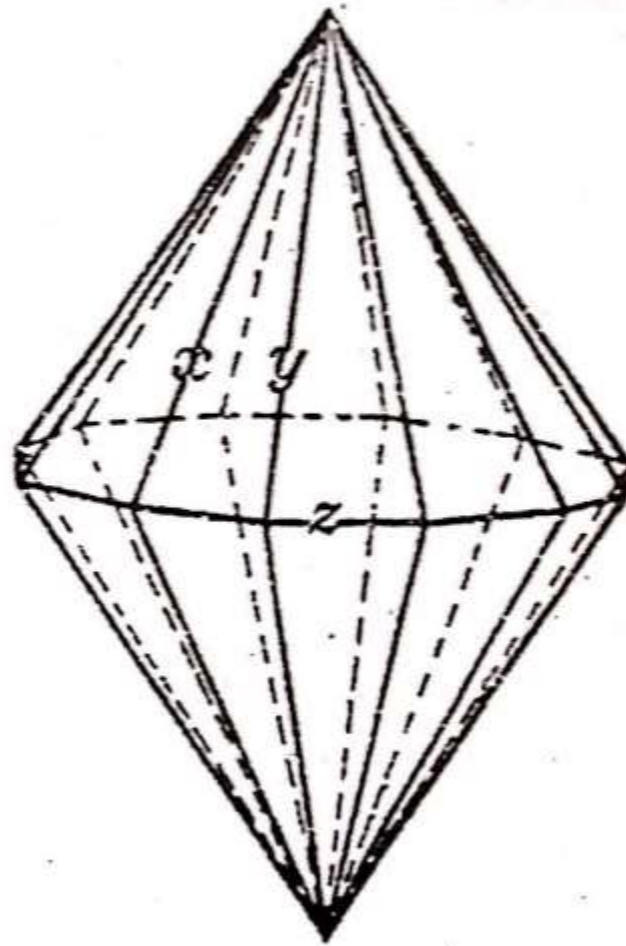
- 12 faces
- Closed form
- Each face cuts the two horizontal axes at equal distance, while parallel to the third one, and also cuts the vertical axis.
- Symbol: $(h0\bar{h}l)$



First Order Pyramid

Dihexagonal Bipyramid

- 24 faces, double twelve-sided pyramid
- Closed form
- Each face cuts the horizontal axes at unequal distances, and also cuts the vertical axis.
- Symbol: $(hki\bar{l})$



Dihexagonal Bipyramid