

-Crystal:- A Crystal is a polyhedral solid bounded by smooth surfaces of definite geometric shapes arranged symmetrically around its central point. the symmetrical arrangement of the parts of a crystal is an external expression of a regular internal three dimensional arrangement of atoms or molecules.

-Parts of crystal (elements of crystal)

1-Face:- The smooth planar surface of some definite geometric shapes.

2- Edge:- The meeting line of two adjacent faces.

3- Solid angle:- (The vertex) the external intersection point of two or more edges.

4- Interfacial angle:- The angle between the columns to the two adjacent faces.

-Crystallographic axes:- These axes are imaginary reference lines and generally taken parallel to the intersection edges of major crystal faces.

a-axis = front to back $a \wedge b = \gamma$

b-axis = side to side $a \wedge c = \beta$

c-axis = top to bottom $b \wedge c = \alpha$

Classified the crystal systems according to:-

1-Length of crystallographic axes.

2-Intersection of crystallographic axes.

-Crystal symmetry

A)Planes of symmetry:-

An imaginary plane that divides the crystal into two mirror image halves.

B)Axes of symmetry:-

An imaginary line through a crystal about which the crystal may be rotated and repeat itself in appearance 2,3,4 or 6 times during a complete rotation (360^0).

C)Center of symmetry:-

It is the central point of the crystal about which similar parts are arranged in opposite directions at exactly equal distances in corresponding positions.