THE SOLID STATE

AMORPHOUS AND CRYSTALLINE SOLIDS

CLASSIFICATION OF SOLIDS: -

On the basis of arrangement of particle in the solid, these can be classified into crystalline & amorphous solids.

S.NO.	CRYSTALLINE SOLID	S.NO.	AMORPHOUS SOLIDS
	True Solid		Pseudo solids, super cooled
			between solid & liquid]
1	The constituent practical (atoms,	1	No particular pattern is followed
	molecule, ion)		practical are random arranged
	follow a definite repetition		
	arrangement.		
2	These have long range order.	2	They have short range order no
			long-range order are found.
3	These are produced by slow cooling	3	Rapid or suddenly cooling of the
	under controlled condition of liquid.		liquid generate the amorphous solid.
	The crystalline structure is also		
	dependent on conditions.		
	Same substance can have different		
	crystalline structure in different		
	condition. Different crystalline		
	structure of the same substance are		
	called its polymorphic forms & this is		
	known as polymorphism.		



Class-12th

Chemistry

CRYSTALLINE SOLID AND ITS CHARACTERISTICS: -

"A crystal is a solid composed of atoms (ions or molecules) arranged in an orderly repetitive array". Most of the naturally occurring solids are found to have definite crystalline shapes which can be recognized easily. These are in large size because these are formed very slowly thus particles get sufficient time to get proper position in the crystal structure. Some crystalline solids are so small that appear to be amorphous. But on examination under a powerful microscope, it is also seen to have a definite crystalline shape. Such solids are known as micro crystalline solids. Thus, the crystallinity of a crystal may be defined as "a condition of matter resulting from an or orderly, cohesive, three-dimensional arrangement of its component particles (atoms, ions or molecules) in space". This three-dimensional arrangement is called crystal lattice or space lattice. The position occupied by the particles in the crystal lattice are called lattice sites or lattice points. The lattices are bound by surface that usually planar and known as faces of the crystal.

"The smallest geometrical position of the crystal which can be used as repetitive unit to build up the whole crystal is called a unit cell."

The angle between the two perpendiculars to the two intersecting faces is termed as the interfacial angle which may be same as the angle between the unit cell edges. Goniometer is used to measure the interfacial angle. It is important to note that interfacial angle of a substance remains the same although its shape may be different due to conditions of formation.



Amorphous Solid and its Characteristics:-

The solids in which the particles are not arranged in any specific order or the solids that lack the overall order of a crystal lattice are called amorphous solids.

The term 'amorphous', when broken down into its Greek roots, can be roughly translated to "without form". Many polymers are amorphous solids. Other examples of such solids include glass, gels, and nanostructured materials.

An ideal crystal is defined as an atomic arrangement that has infinite translational symmetry in all the three dimensions, whereas such a definite definition is not possible for an ideal amorphous solid (a-solid)