

Solid State.

The 1. INTRODUCTION

The constituent particles in solids have fixed positions and can only oscillate about their mean positions. So the solids are rigid.

1.1. CHARACTERISTICS OF SOLID STATE

- i) They have definite mass, volume and shape.
- ii) Intermolecular distances are soft.
- iii) Intermolecular forces are strong.
- iv) Their constituent particles (atoms, molecules or ions) have fixed positions and can only oscillate about their mean positions.
- v) They are incompressible and rigid.

1.2. CLASSIFICATION OF SOLIDS - Solids are classified on the basis of following parameters.

- a) based on various properties.
- b) based on bonding present in building blocks (Crystals - like)

1.2. a) Based on various properties.

- | | Crystalline | Amorphous |
|--------------------------|--|--|
| i) Shape | i) Definite, characteristic geometrical shape. | i) Irregular shape. |
| ii) Clear Mp. | ii) Melt at sharp and characteristic temp. | ii) Gradually softer over a range of temp. |
| iii) Cleavage property. | iii) When cut into pieces the newly generated surfaces are plain & smooth. | iii) Cut with irregular shapes. |

iv) Heat of fusion v) Anisotropy vi) Nature	Definite Anisotropic in nature True solids	Indefinite Isotropic in nature Pseudo solids or super cooled liquids.
vii) Order in arrangement of constituent particles.	Long range order	Only short range order.

ANISOTROPIC - i) Crystalline solids are anisotropic in nature, that is, some of their physical properties like electrical resistance or refractive index show different values when measured along different directions in same crystal. Since the arrangement of particles is different along different directions.

ii) Amorphous shows isotropic due to no long range order in them and arrangement is ~~irregular~~ irregular along all the directions. Therefore, value of any physical property would be same along any direction.