Matter

- Solid
  - Crystalline
  - Non-Crystalline (Amorphous)
- Liquid
- Gas
- Plasma

Crystalline:- In this solid atom or molecule arranged in a regular or periodic manner.

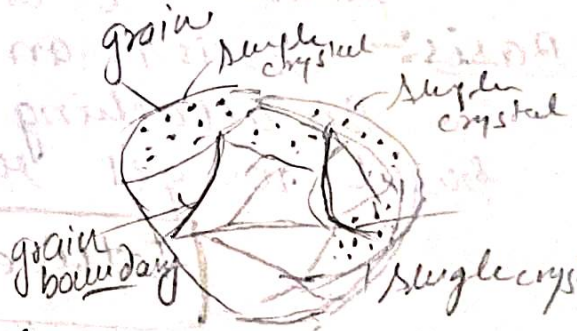
Amorphous:- If the arrangement of atoms or molecules are random, then the solid is known as Amorphous solid or Non-Crystalline solid.

Crystalline:-

- Single Crystalline
- Poly Crystalline

* In single crystal throughout the crystal only one type of arrangement.

* Poly crystalline as whole is large aggregate of large no. of single crystal. Each single crystal separetly called grain and the boundary which seperate them are called grain boundary. The physical property depend upon the number of grain



Examples. Single Crystal (Naturally occured)
⇒ Diamond, Quartz
Poly Crystalline:- Gold, Copper, Al. etc.

* Physical property are strictly depend upon structure.
for eg.

Carbon

Diamond
(Electrical Insulator)
Thermal conductor

Graphite.
(Electrical Conductor)
(Thermal insulator)

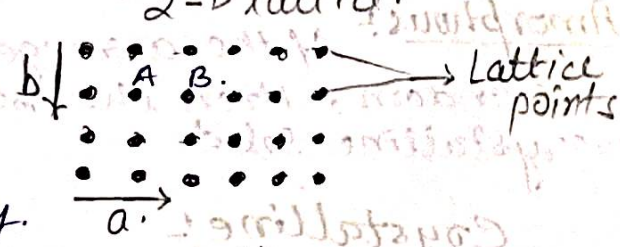
Crystallography:- (This is method of studying the crystal structure.).

① Lattice:-

Lattice is basically regular arrangement of imaginary points in the space

* Lattice is the mathematical concept means only an imaginary concept.
* Ideal lattice has no boundary.

2-D lattice:



Type of lattice

Bravais lattice / Space lattice :⇒

A lattice will be Bravais lattice only if each lattice has identical surrounding.

In above fig. point A & B are identical lattice points (Bravais lattice).

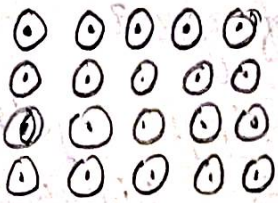
Basis:- Basis is an atom or group of atom.

By attaching the basis to each lattice point we get the crystal structure.

Lattice + Basis = Crystal

Another name of basis is motive.

⇒ Monoatomic Basis:-



⇒ Crystal Structure.