

## Phase diagram.

It is a plot on temp. and composition of different material.

\* In other language "phase diagram tell us what is the melting point of alloy at different temperature."

Gibbs phase rule.

$$P + F = C + 2$$

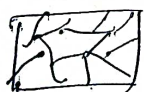
where  $P \rightarrow$  phase,  
 $F \rightarrow$  Degree of freedom  
 $C \rightarrow$  component

Crystal  $\rightarrow$  A crystalline solid or crystal is a solid material whose atoms, molecules & ions ~~are~~ are arranged in a highly ordered structure in all direction.

\* In addition single crystal are usually identified by their geometrical shape.

\* The scientific study of crystal and crystal formation is known as crystallography.

\* The boundary between the grains is <sup>term as</sup> the grain boundary, across which the orientation of crystal changes.



Non Crystalline or Amorphous Material.

Random arrangement of atoms ~~to~~ in the solid material are known as Non crystalline material.

Ex. Silicates glass, ~~Amorphous~~ polymer.



# Phase diagrams

- \* It plot a graph between temp. and composition of material.
- \* We can see from these diagrams the change in phases with respect to changes in temp. or composition.
- \* It is also drawn at equilibrium state.
- \* The alloy system involve no. of component. Due to this phase diagram are classified as follows -

- ① Unary phase diagram.
- ② Binary " "
- ③ Ternary " "
- ④ Quaternary " "

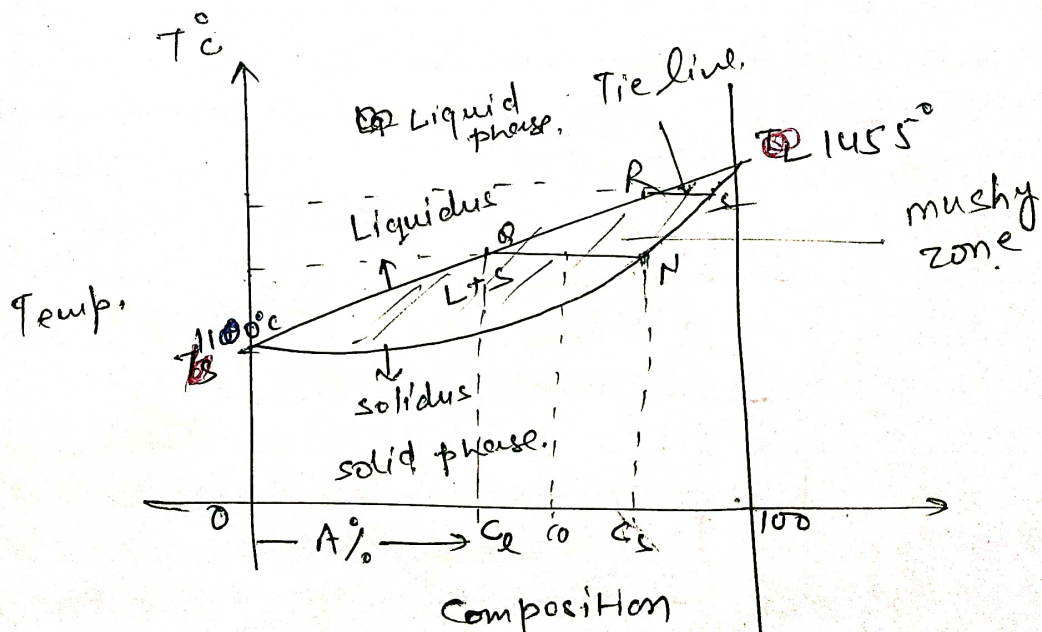
Equilibrium diagram of a Binary system in which the two Binary metals are completely soluble in the liquid & solid state.

Such diagram contain two component, for plotting.

Binary isomer

$$m_L = \frac{C_S - C_0}{C_S - C_L}$$

$$m_S = \frac{C_0 - C_L}{C_S - C_L}$$



Liquidus phase  $\rightarrow$  beginning of solidification or completion of melting.  
 Solidus  $\rightarrow$  completion of solidification or beginning of melting.