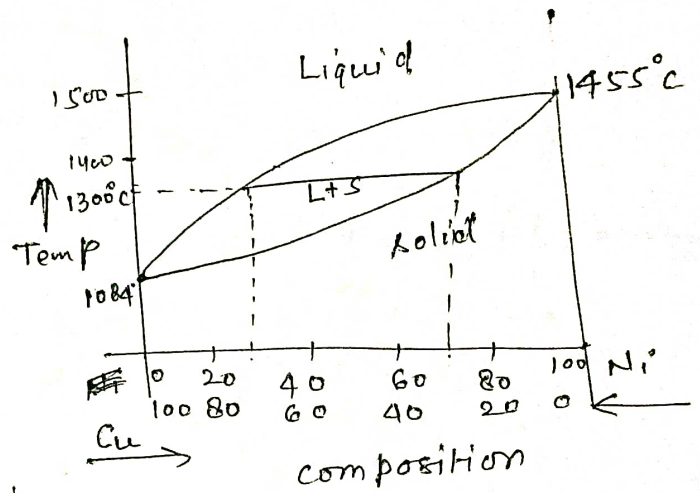


Equilibrium Diagram of a Binary System in which the two metals are completely soluble in the liquid & solid state. →

The cooling curve for pure Cu contains a flat portion during which complete solidification takes place at const. temp. When 20% Ni is added the flat portion is no longer present but the solid solution solidifies over a range of temp. With Ni wt% increasing similar behaviour occurs, but when 100% Ni is reached the liquid transform into solid and again contain a flat portion. From these cooling curve the phase diagram is constructed.

There is a tie line which shows the alloy composition in mushy zone.

if a series of tie-lines is drawn at lower temp. in the two phase regions, it can be noted that the proportion of solid increases with decreasing temperature. and the composition of the solid



when a cooling rate is slow enough to maintain equilibrium the solid formed changes composition by diffusion so that at any temp. all the solid is of the same composition.

Generally the rate of cooling is very rapid and the composition of solid solution as discussed above rarely occurs. This result is a non-uniform structure will form.

The grains obtained are heterogeneous due to variation in composition and are said to be cored. This phenomenon is called coring.

