

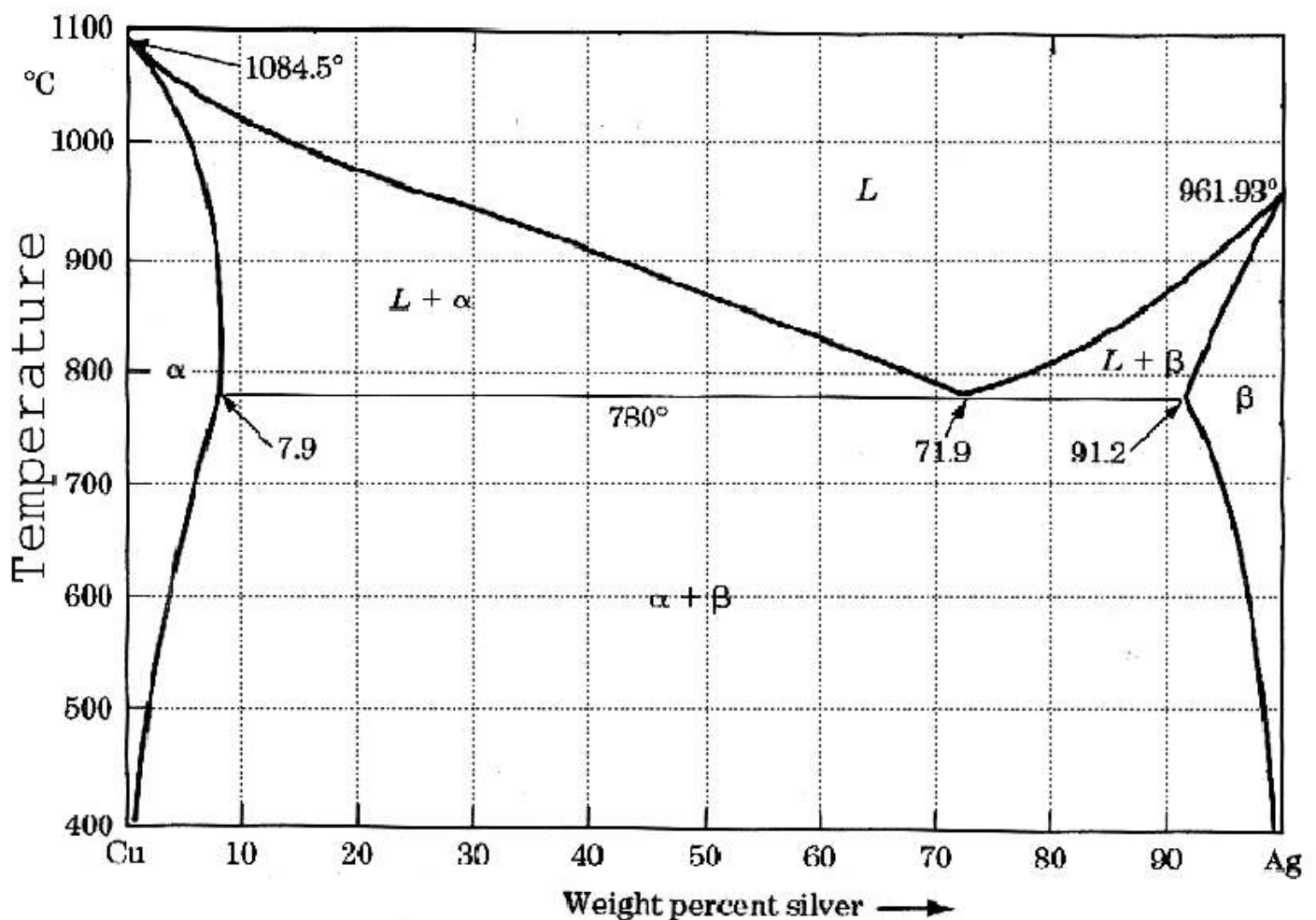
ME211

Homework on Equilibrium Phase Diagrams

The equilibrium phase diagram of Cu-Ag alloy system is given below. Answer the following for an alloy that contains X% Ag (X differs according to group no. as per table below),

Group no.	1	2	3	4	5	6
X wt.%Ag	5	25	50	80	90	95

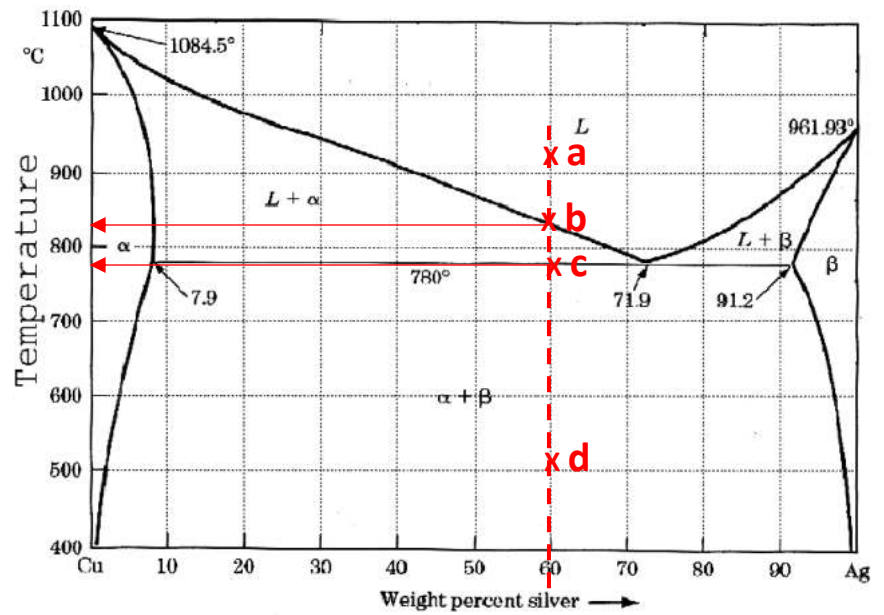
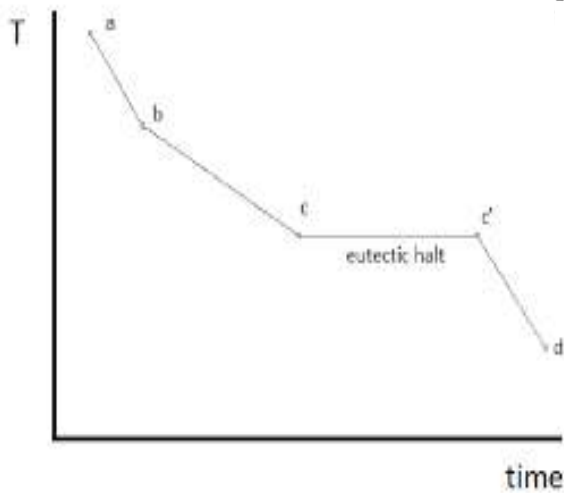
- Draw schematically the cooling curve and show temperatures arrests (temperature values at which phase changes occur).
- Conduct a complete phase analysis as per the table below.
- At 400°C, find the relative amount (wt.%) of $\alpha_{Eut.}$ for hypo-eutectic alloys or $\beta_{Eut.}$ for hyper-eutectic alloys



Answer sheet

(a)

e.g. For an alloy X=60%



(b)

Temperature	Phases	Wt.% Ag (show on phase diagram)	Phase amount (Show the calculations)	Microstructure
$T_l + \Delta T$				
$T_l - \Delta T$				
$T_E + \Delta T$	α	e.g 30		
	θ	e.g. 43		
$T_E - \Delta T$				
$T_s + \Delta T$				
$T_s - \Delta T$				
500°C				

(c)

At $T_E + \Delta T \rightarrow \alpha_{pro} = \dots$

At $400^\circ\text{C} \rightarrow \alpha_{Total} = \dots$

Thus, $\alpha_{Eut.} = \alpha_{Total} - \alpha_{pro} = \dots\dots\dots$