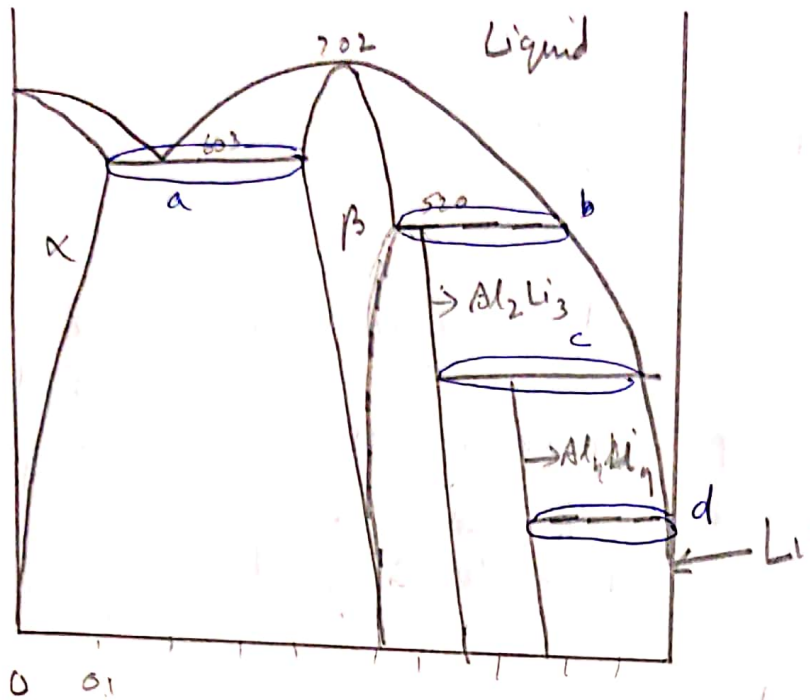


Q1)



- a) Eutectic reaction: $L \rightarrow \alpha + \beta$
- b) Peritectic reaction: $L + \beta \rightarrow Al_2Li_3$
- c) Peritectic reaction: $L + Al_2Li_3 \rightarrow Al_4Li_9$
- d) Eutectic reaction: $L \rightarrow Al_4Li_9 + Li$

- ~~b) a) $C=1$ $P=2$
 $F = C - P + 2 = 1 - 2 + 2 = 1$ (If we change Temp/pressure no other will get fixed)~~
- ~~b) $C=2$ $P=1$ (We can change 3 parameters, Temp, Pressure, and composition of 1 of the components)
 $F = C - P + 2 = 2 - 1 + 2 = 3$~~
- ~~c) $C=2$ $P=2 \Rightarrow F=2$~~
- ~~d) $C=2$ $P=2 \Rightarrow F=2$~~
- ~~e) $C=2$ $P=3 \Rightarrow F=1$~~

1) b)

a) At melting point of pure Al

$$C = 1 \quad P = 2$$

$$F = C - P + 2 = 1 \Rightarrow \text{If pressure is const then } 1 - 1 = 0$$

If we fix temp / pressure, the other one gets automatically fixed. If pressure is const, every other parameter is fixed

b) Inside α region

$$C = 2 \quad P = 1$$

$$F = C - P + 2 = 3 \Rightarrow \text{If pressure const. } \Rightarrow 3 - 1 = 2$$

We have to ~~also~~ fix at least 2 parameters for other parameters to get fixed, like temp and pressure and composition of 1 of the substance. If pressure is const

c) Inside $\alpha + \text{liquid}$ region we can set only 2 parameters -

$$C = 2 \quad P = 2$$

$$F = 2 \Rightarrow \text{If pressure is const } \Rightarrow 2 - 1 = 1$$

If we fix temp & pressure, the composition of the substances get fixed automatically. Also if pressure is const, we can set only 1 other parameter

d) Inside $\alpha + \beta$ region

$$C = 2 \quad P = 2$$

$$F = 2 \Rightarrow \text{If pressure is const } \Rightarrow 2 - 1 = 1$$

similar to (c), we can fix 2 parameters independently, including pressure (which is const in this case)

e) At an eutectic point

$$C = 2 \quad P = 3$$

$$F = 1 \Rightarrow \text{If pressure is const } \Rightarrow 1 - 1 = 0$$

We have only 1 independent parameter, which can be either temp or pressure