

01

Date 24/03/20

Expt. No. ....

for B.Sc (Hons) Part II Std

Page No. ....

Phase rule

DR. S.K. JHA

Asst. Prof. (Genl)

Marwari College DBT.

$$F = C - P + 2$$

⇒ Phase (P): -

- It is homogeneous.
- It is physically distinct
- It can be separated mechanically from other part of system is called phase.

(A)

~~Immiscible~~ Immiscible phaseH<sub>2</sub>O | CCl<sub>4</sub>H<sub>2</sub>O | etherH<sub>2</sub>O | Oil. (Phase = 2)

Miscible phase

water | acetone

coats | Ethyl Alc.

milk | water.

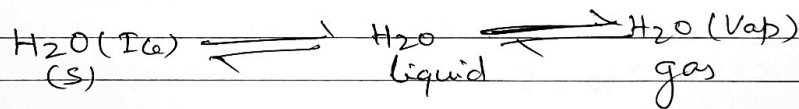


1 character.

Phase = 1

Gas - mix up with each other,

So phase = 1.

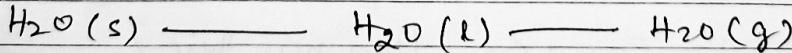


Phase = 3.

Component (C)

Smallest no. of independent variable  
Constituents of System. is called Component.

eg ①



②

Phase = 3

Component = 1

eg ②



Phase = 4

Component = 1

Teacher's Signature : \_\_\_\_\_

2020/03/24 17:42

(02)

eg Component for chemically reactive System:

$$C = N - E$$

C = Component

N = No. of Species

E = No. of independent equation.

eg: ~~Det. no. of~~ Det. no. of Component for following  
KCl, NaCl, H<sub>2</sub>O.

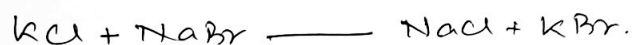
Soln:  $N = 3, E = 0$

$$C = N - E$$

$$= 3 - 0$$

$$\boxed{C = 3}$$

② KCl, NaBr, & H<sub>2</sub>O



KCl, NaBr, H<sub>2</sub>O, NaCl, KBr.

$$N = 5$$

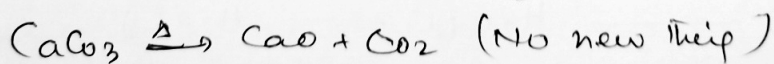
$$E = 1$$

$$C = N - E$$

$$= 5 - 1$$

$$= 4$$

③ CaCO<sub>3</sub> (s), CaO (s), CO<sub>2</sub>



$$N = 3, E = 1,$$

$$C = N - E$$

$$= 3 - 1$$

$$\boxed{C = 2}$$

④  $\text{NH}_4\text{Cl}$ ,  $\text{NH}_3$ ,  $\text{HCl}$  in form of partial pressure.



$$P_{\text{NH}_3} = P_{\text{HCl}}$$

$$N = 3, E = 2$$

$$C = N - E$$

$$= 3 - 2$$

$$= 1$$

2<sup>nd</sup> Partial pressure  
not given.

$$\text{then } E = 1$$

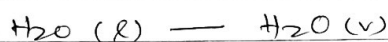
$$N = 3$$

$$C = 3 - 1 = 2$$

⑤ Degree of freedom :-

Smallest no. of variable factors i.e.  $T, P, \& C$

Equilibrium



$$\text{Phase} = 2$$

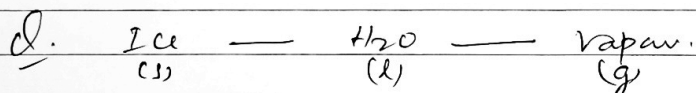
$$\text{Component} = 1$$

$$F = C - P + 2$$

$$= 1 - 2 + 2$$

$$= 1$$

$F = 1$  Monovariant,  $F = 2$  Divariant,  $F = 3$  Trivariant.



$$\text{Phase} = 3$$

$$\text{Comp} = 1$$

$$F = C - P + 2$$

$$= 1 - 3 + 2$$

$$F = 0 \text{ Univariant System}$$

Phase: A chemically homogeneous, physically distinct & mechanically separable part of the system is called phase.

Three phases of matter: S, L, & G.

Solid phase: Having different crystal structures are considered as different phases.

Ex: BCC (X), FCC (Y) with T