

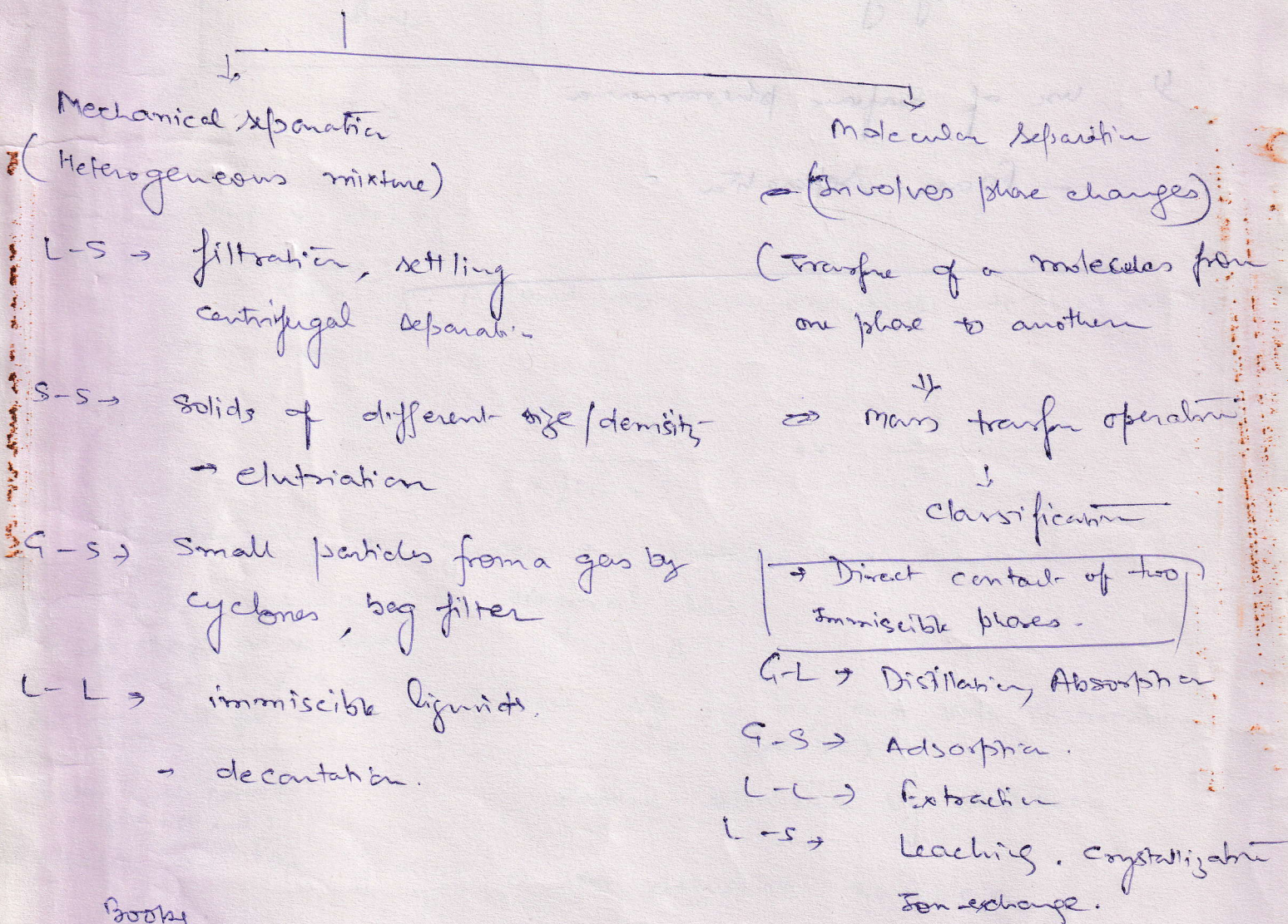
Introduction

unit operation

unit process

- Heat transfer $\rightarrow$ Energy
 - Mass Transfer $\rightarrow$ mass
 - Fluid Mechanics $\rightarrow$ flow
- based on fundamental these law.
- $\rightarrow$ chemical rxn engg

Separation



Books

- R. E. Treybal $\rightarrow$ Mass transfer operation
- Geankoplis $\rightarrow$ Transport process and separation process principles
- Seader $\rightarrow$ Separative process principles
- B. V. Datta

2 → Phase separated by membrane

G-G - diffusion, effusion

G-L Permeation

L-L - Dialysis, Electrodialysis, Reverse osmosis

3 → Direct contact of miscible phases.

- Thermal diffusion

- Centrifugation

4 use of surface phenomena.

- Foam separation -

Distillation → Distillation is a method of separating the components of a solution which depends upon the distribution of substances b/w gas and liquid phase. (1)

Salt-water - Evaporation. (non-volatile - salt)

(NH_3 - H_2O) distillation → so all the components are appreciable volatile

→ Application of heat

- direct separation → into pure product

V-L Equ.

distillation methods depends greatly upon an understanding of equilibria existing b/w vapour and liquid phase.

P-T-Conc.

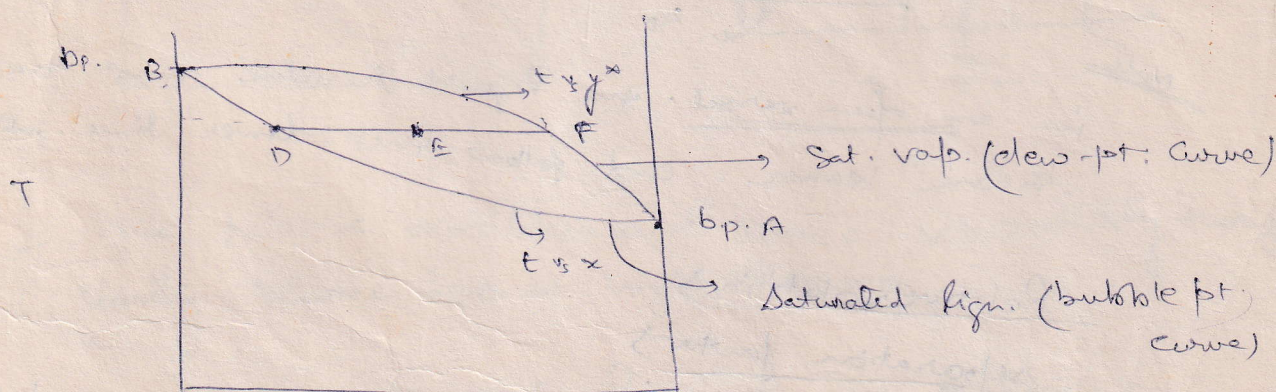
Comp. A of binary mix. A & B as more volatile

$V.P.A > V.P.B.$ at any T

x - mole fraction in liquid phase

y - vapour phase

Const P Equ.



liquid and vap_{or} are at the same T and P

E = two-phase mix consist of a liquid phase composition D and vap phase composition at F in such a proportion that the avg composition of the entire mixture is represented by E.