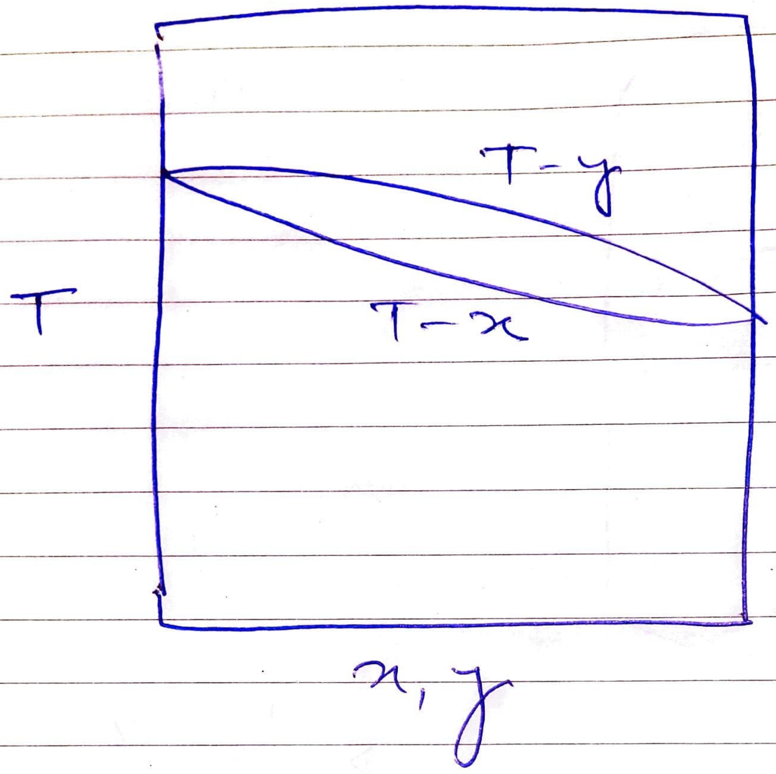
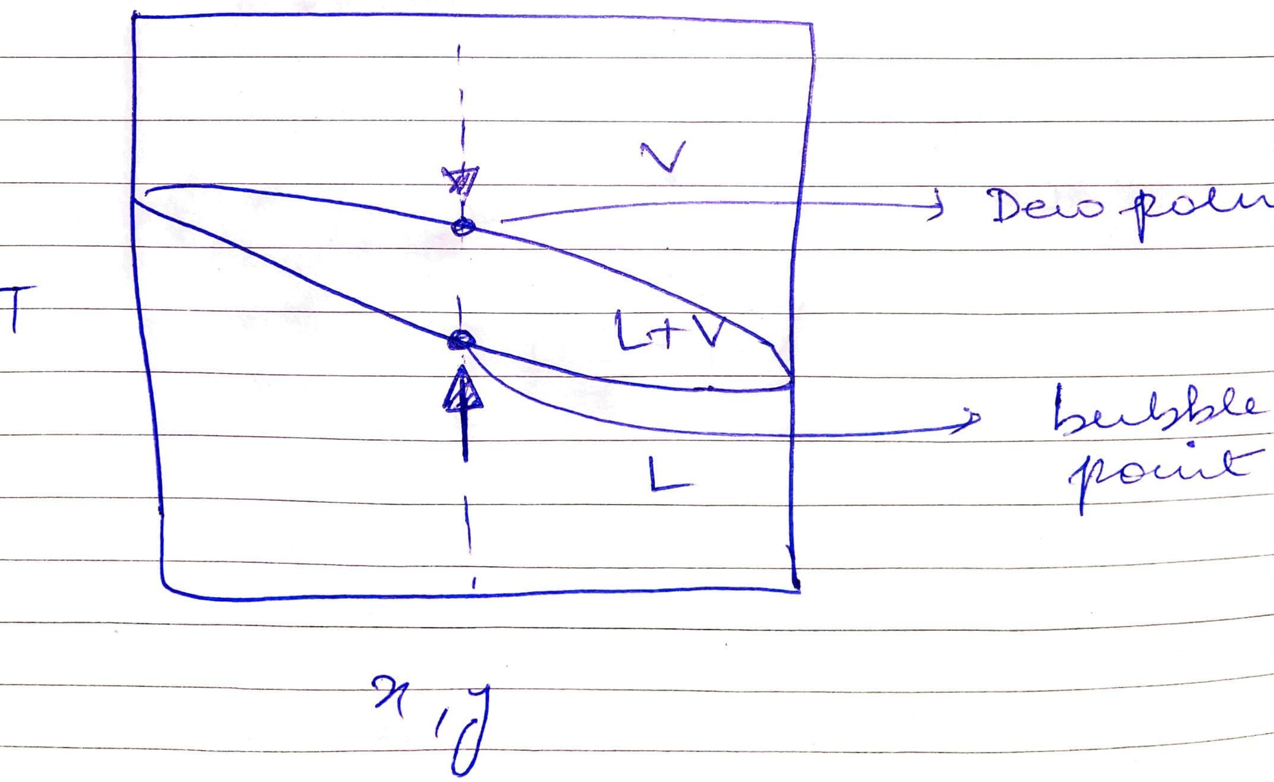
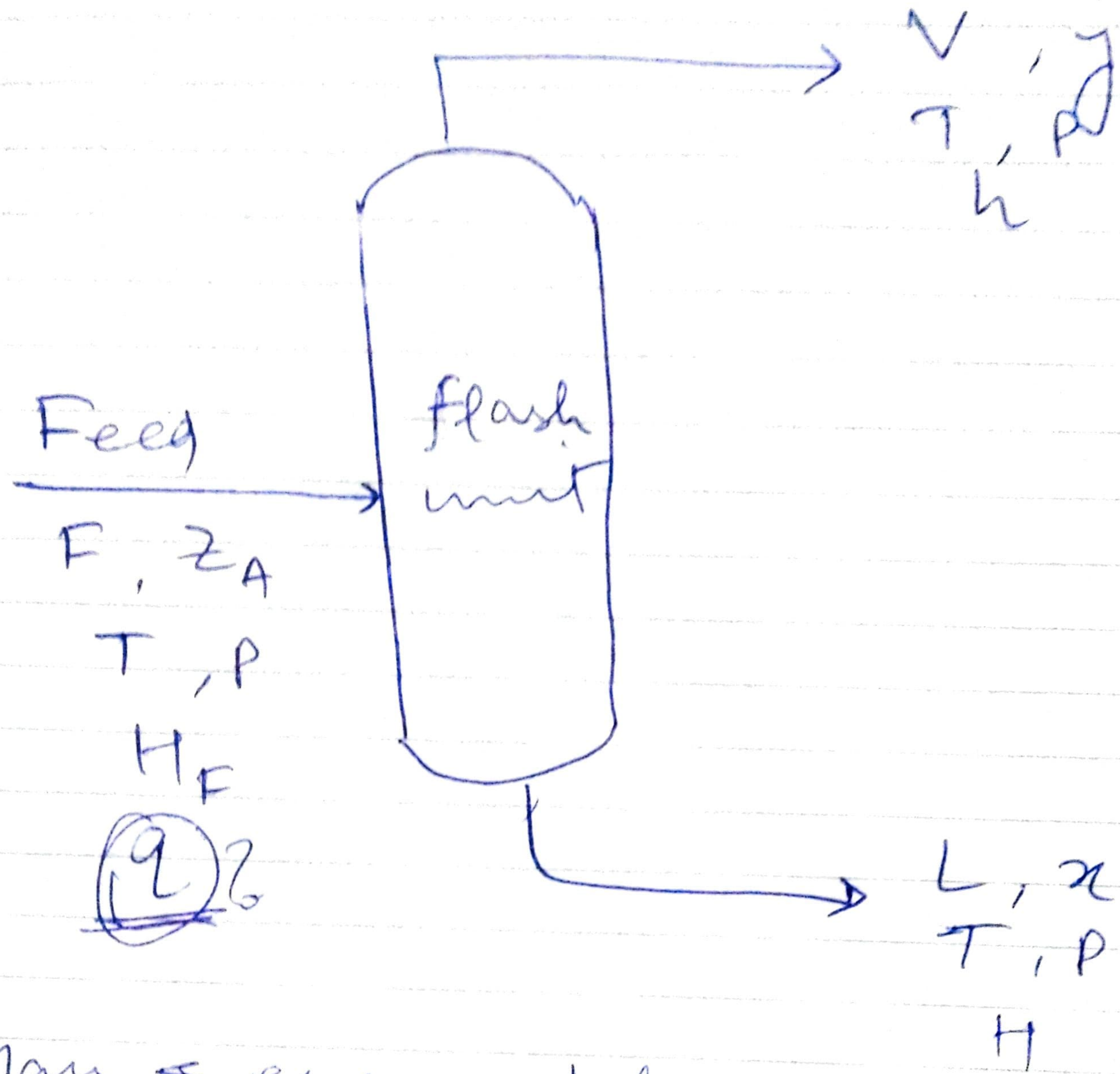
for a constant Pressure,

This diagram shows or ~~relates~~ represents a binary ~~..~~ mixture.







Mass & energy balance :

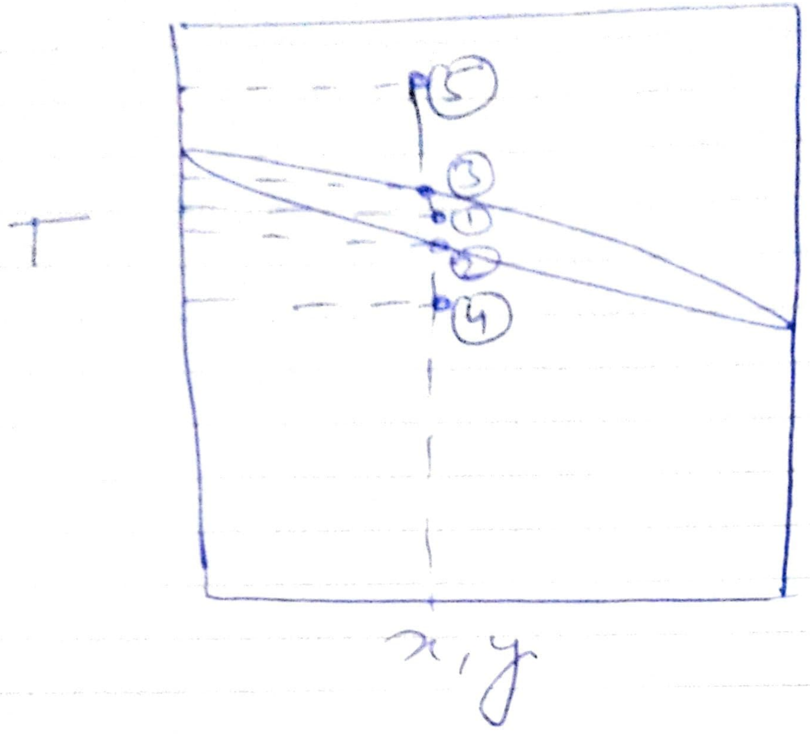
$$F = V + L$$

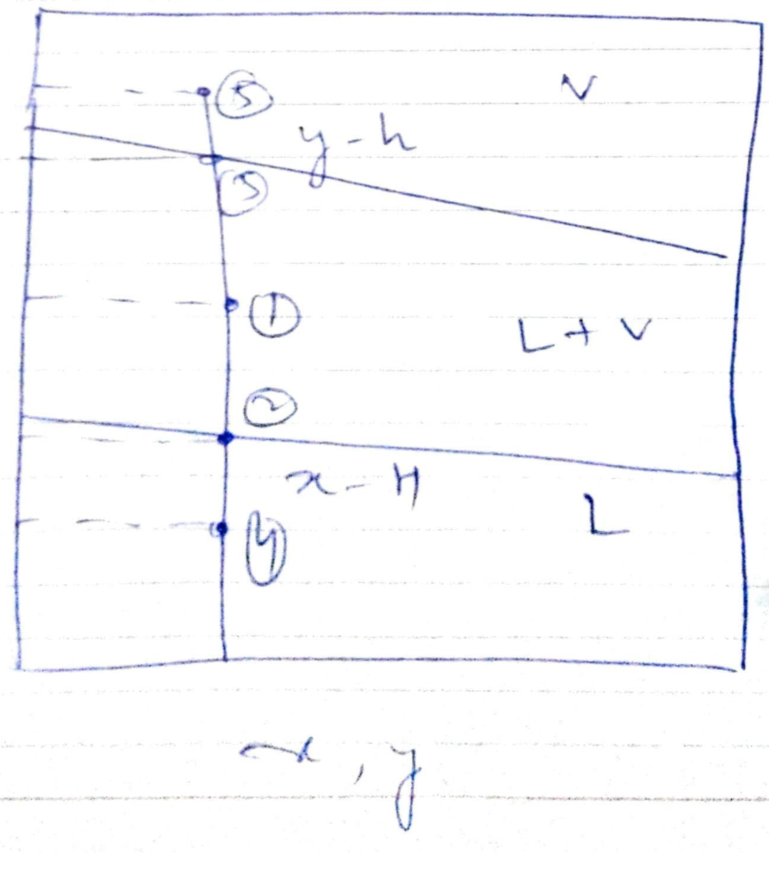
$$F z_A = V y + L x$$

$$F H_F = V h + L H$$

q = feed quality

q = 1 for sat liq
  = 0 for sat vap.


T
5
3
1
2
4
x, y


5
V
y-h
3
1
L+V
2
x-H
4
L
x, y

(1) → Liquid + Vapor [VLE]

(2) → saturated liquid

(3) → saturated vapor

(4) → subcooled liquid

(5) → superheated vapor

So how to determine feed condition

for given T, P, Z

Binary mixture : A + B

if we assume solution to be an ideal liquid Raoult's law will be applicable

$$\Rightarrow y_i P = x_i P_i^{sat}$$

say, $K_i = \frac{y_i}{x_i} = \frac{P_i^{sat}}{P}$

$$K_i = f(T, P)$$

$$\ln p^{sat} = A - \frac{B}{T+C}$$ from antoine's law

Calculate $\cancel{K_i}$

$$\sum z_i K_i = z_A K_A + z_B K_B$$

$$\sum \frac{z_i}{K_i} = \frac{z_A}{K_A} + \frac{z_B}{K_B}$$

$$\alpha_{ij} = \frac{K_i}{K_j}$$

→ relative volatility of component 'i' with respect to 'j'

if	$\sum K_i z_i$	$\sum \frac{z_i}{K_i}$	Feed
	>1	>1	L+V
	$=1$		Sat liq
		$=1$	sat vap
	<1		sub liq
		<1	superheated vapour

4.00 for (V + L) system

5.00 $$F = L + V$$

6.00 $$F z_i = L x_i + V y_i$$

7.00 for, $i = A, B$

11 SUNDAY $$F z_A = L x_A + V y_B$$

$$F z_B = L x_B + V y_c$$

$$\sum x_i = 1 \quad , \quad \sum y_i = 1$$

	M	T	W	T	F	S	S
JANUARY 17	30	31					1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29

8.00

$$\boxed{\frac{y_i^\circ}{x_i} = k_i^\circ} \checkmark$$

9.00

10.00

for enthalpy

11.00

first take a reference temp

12.00

1.00

@ $T = T_{ref}$

$\Delta H_{ref} = 0$

2.00

Cp_{liq}

3.00

Cp_{vap}

4.00

$$\Delta H = n(Cp \underbrace{\Delta T}_{(T - T_{ref})} + \lambda_i^\circ)$$

5.00

6.00

latent heat (if phase change is occuring

7.00