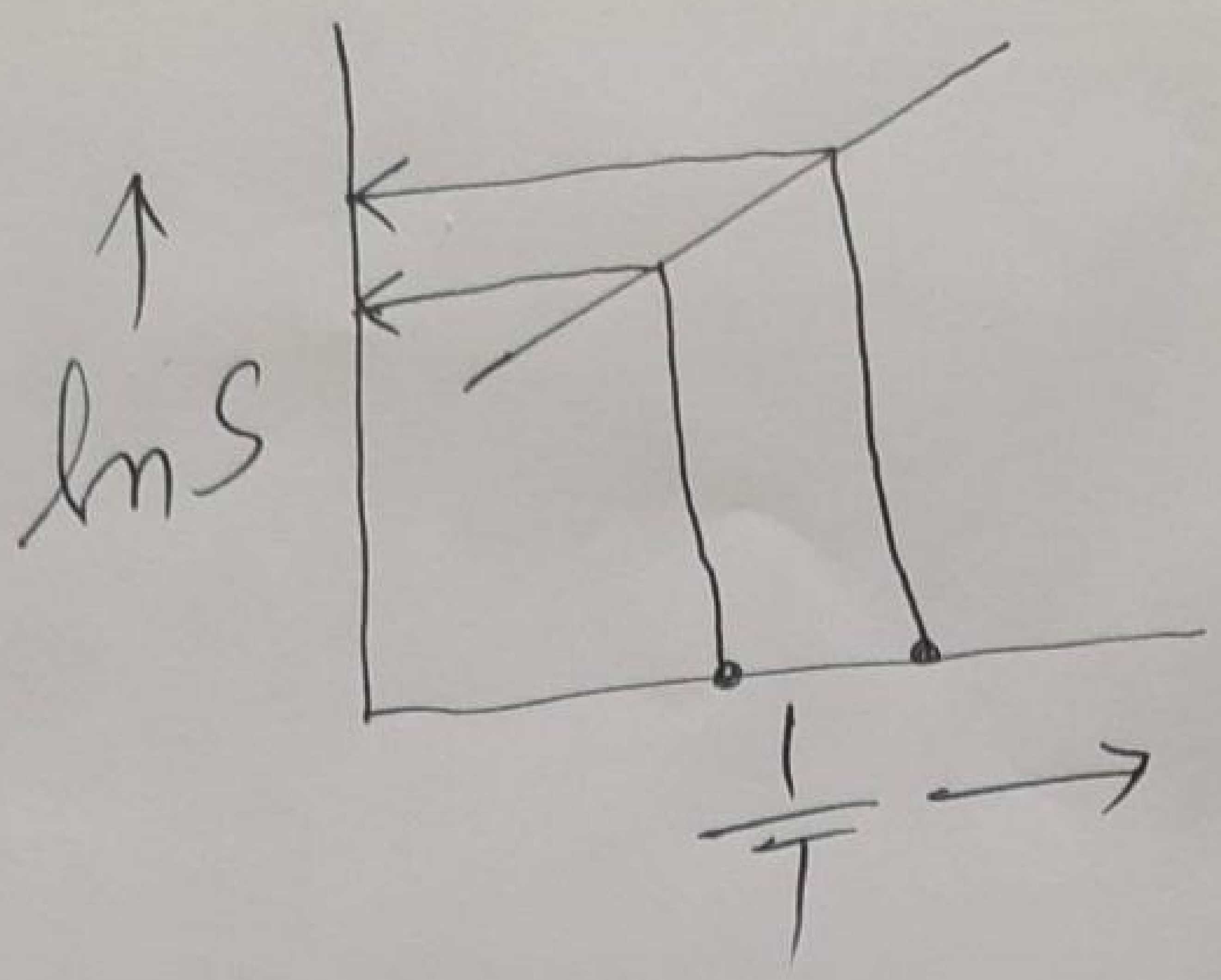
*(Tree and Pond)



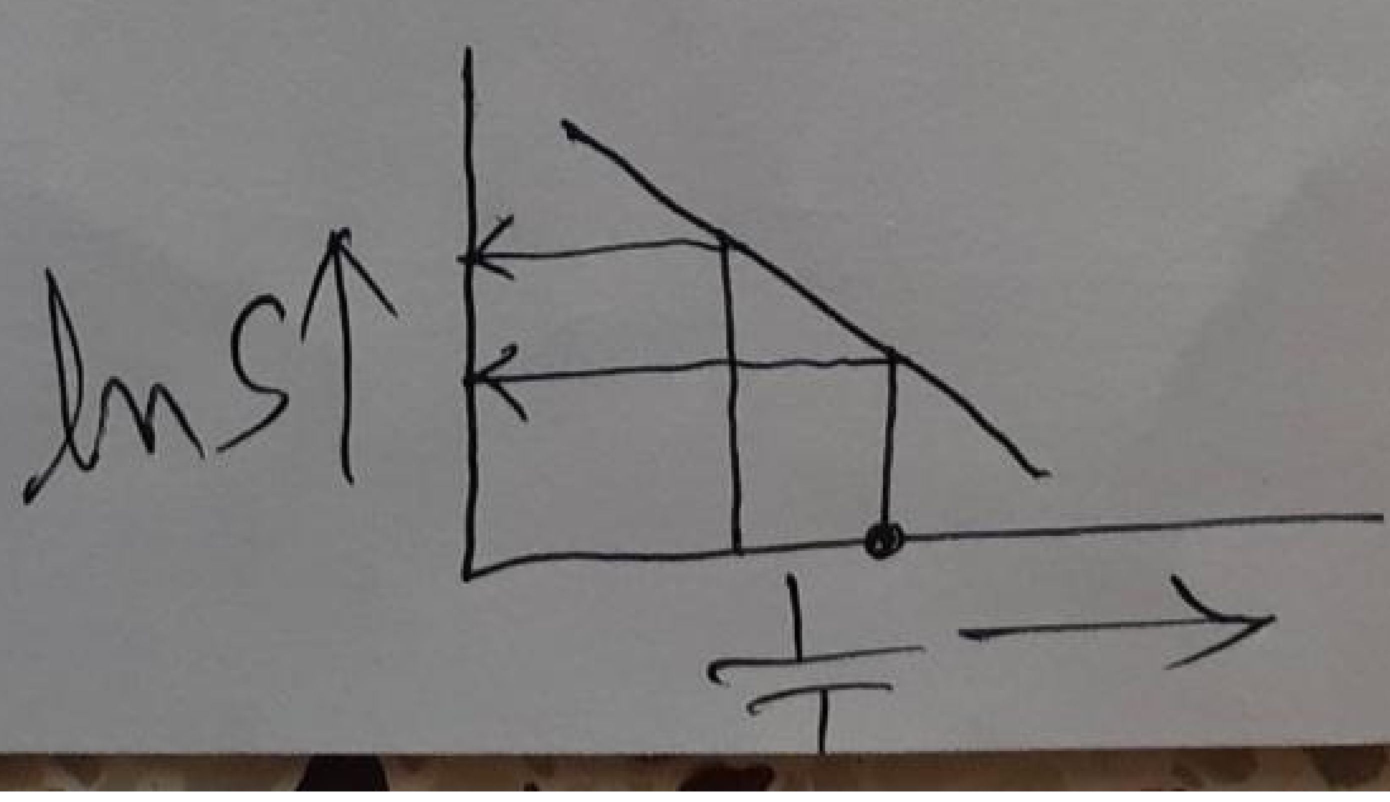
~~For exother~~ The solubility of gas in liquid decreases with increasing temperature.

- For solid-liquid system: $\longrightarrow$ endothermic

$$\text{solid} \underset{\text{exo}}{\overset{\text{endo}}{\rightleftharpoons}} \text{liquid}$$

As solid-liquid system is endothermic. So its ΔH will be positive. Thus equation (1) becomes—

$$\ln S = -\frac{\Delta H}{RT} + \text{Constant} \longrightarrow (3)$$



Solution

- Solution = solute + solvent
  - solute → (minor)
  - solvent → (Major) - component

- Mixture → Homo/Hetero-geneous mixture
  - ↓ two or more different substances (mixed not chemically combined)

- Homogeneous → <u>uniform</u>/ only single phase

- Modes of expressing concentration
  (1) Molarity → mol/L (solution)
  (2) Molality → mol/kg (solvent)
  (3) Normality → g. equivalent/L (Solution)
  (4) Mole-fraction → $X_i = \frac{n_i}{n_T}$
  **(5) ppm → Parts per million (mg/L)
  ↳ Very very ~~dilute~~ solution

* (- - - . is the number of - - - - of a solute in 1 - - - of - - - - - .)

- Henry's law:

① Soft-drink (CO_2)
② Fish-water

mass of dissolved gas, $m \propto P$.
(in solvent)

or, $m = K_H \cdot P$ —— (1)

- **Limitations**: It applies closely to gases with nearly ideal behaviour.

(1) at moderate temperature and pressure

(2) The solubility of gas in solvent is low

(3) The gas does not react with solvent.

(4) The gas does not associate or dissociate in solvent.

- Temperature effect on <u>solubility of gas in liquid</u>:

$$\text{Gas} \underset{\text{endo}}{\overset{\text{exo}}{\rightleftharpoons}} \text{Liquid}$$

$\downarrow$

Exothermic. <u>Le-chatelier P.</u>

Vant Hoff isotherm equation,

$$\frac{d}{dT} \ln S = \frac{\Delta H}{RT^2}$$

| Here, S =
| ΔH =
| R = , T

On integrating

$$\ln S = -\frac{\Delta H}{RT} + \text{constant} \quad \text{---} (1)$$

As gas-liquid system is exotherm[ic] So its ΔH will be negative, Thus equation (1) becomes-

$$\ln S = +\frac{\Delta H}{RT} + \text{Constant} \quad \text{---} (2)$$