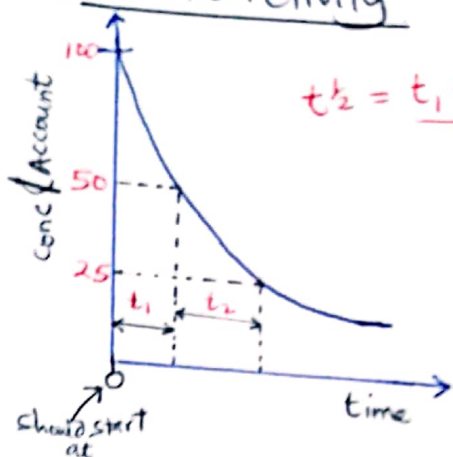


# GRAPHS IN PHYSICAL CHEM.

Plotting **P** — any 3 pts  
 axes — **A** — axes  
 shape — **S** — curve  
 scale — **S** — straight line of best fit (at least passing through 3 pts)

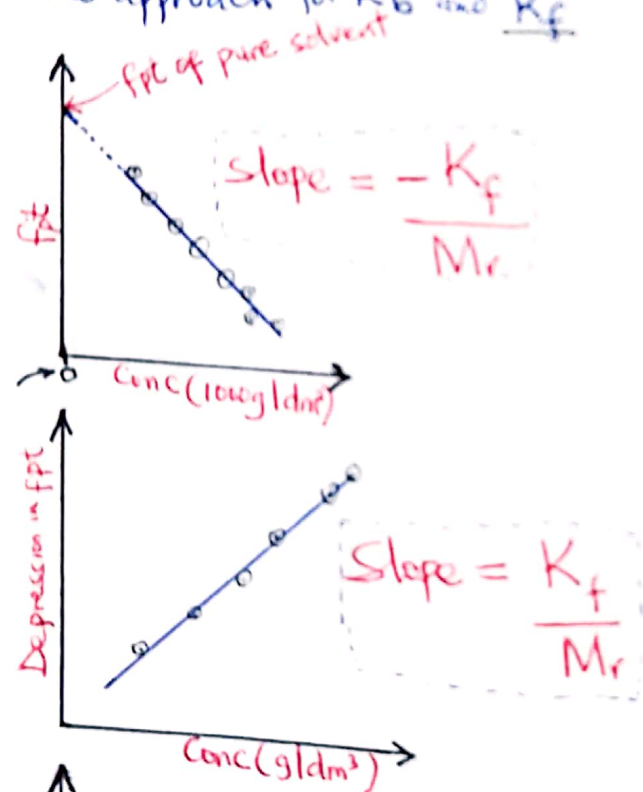
## ① Radioactivity



$$t_{1/2} = \frac{t_1 + t_2}{2} ; t_{1/2} = \frac{\ln 2}{K}$$

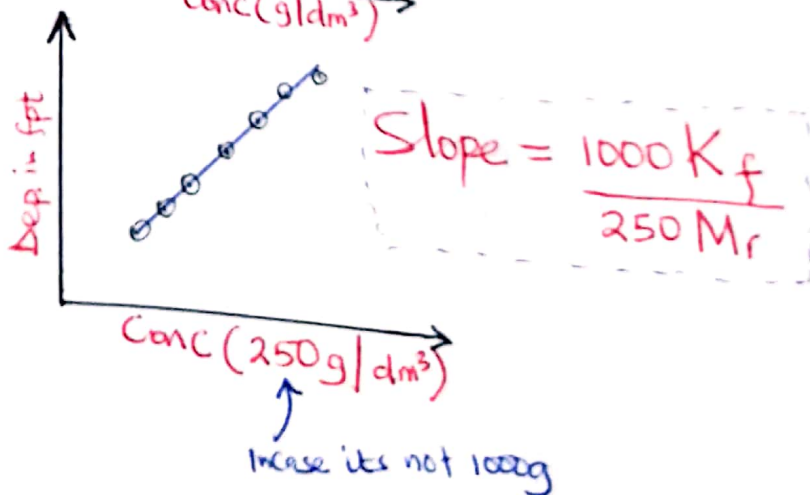
## ② Colligative properties

Same approach for  $K_b$  and  $K_f$



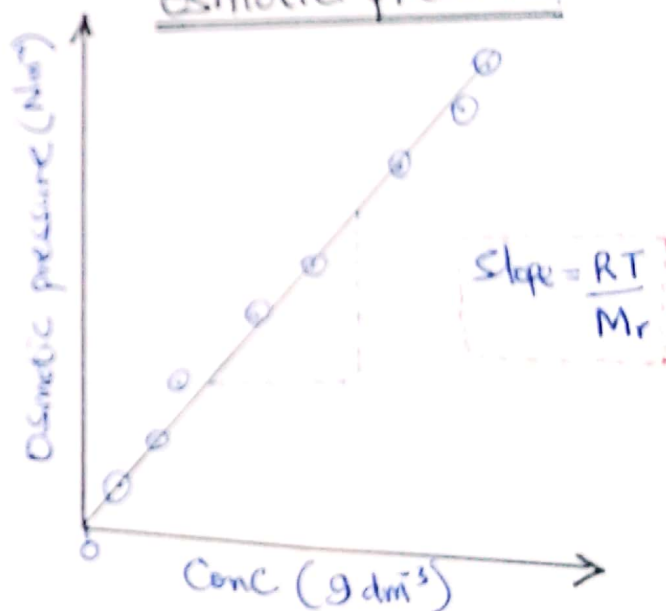
$$\text{slope} = -\frac{K_f}{M_r}$$

$$\text{slope} = \frac{K_f}{M_r}$$



$$\text{slope} = \frac{1000 K_f}{250 M_r}$$

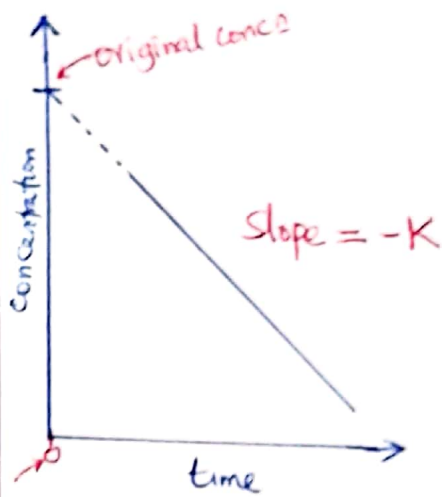
## Osmotic pressure



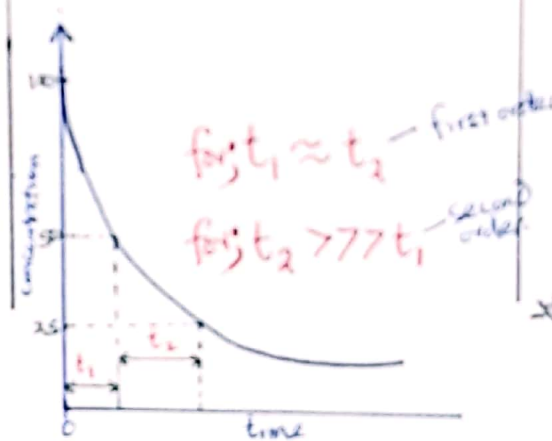
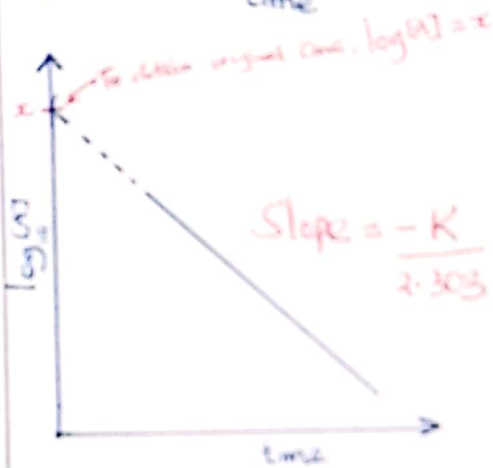
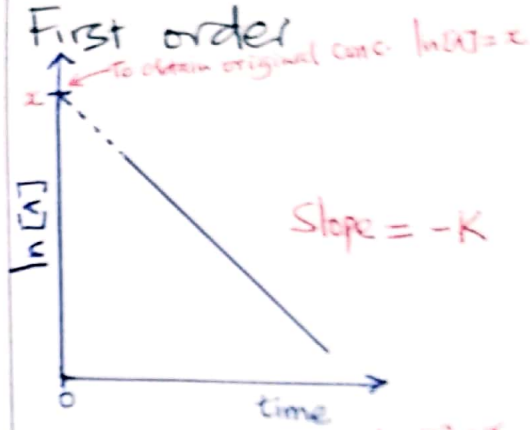
$$\text{slope} = \frac{RT}{M_r}$$

### ③ CHEMICAL KINETICS:

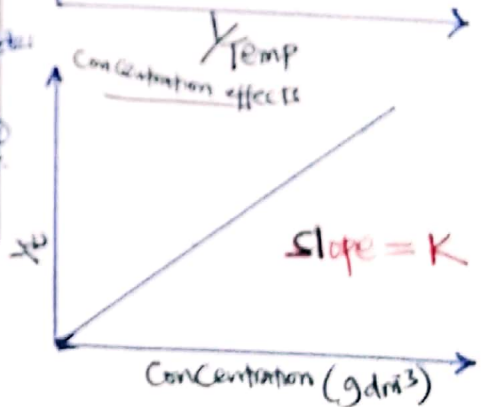
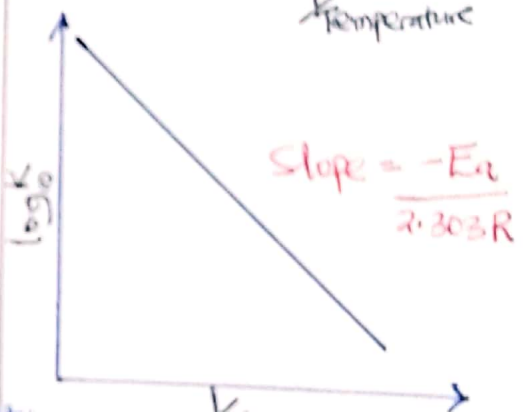
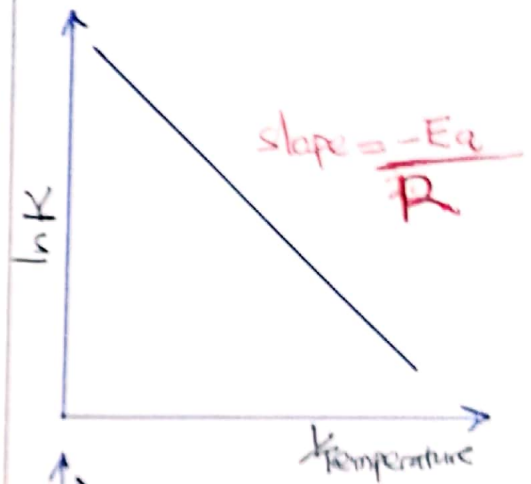
#### Zero order



#### First order

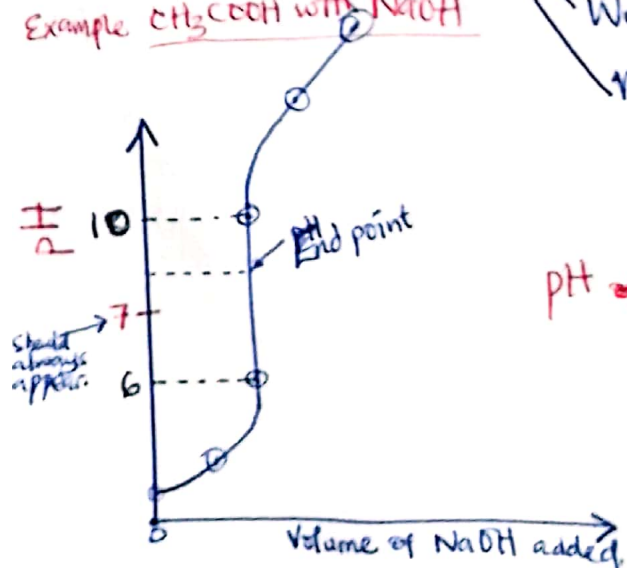


#### Temp effects - Arrhenius eqn. ( $K = Ae^{\frac{-E_a}{RT}}$ )



### ④ IONIC EQUILIBRIA.

- (a) Titration curves
- Strong acid vs strong base ✓
  - Strong acid vs weak base ✓
  - Weak acid vs strong base ✓
  - Weak acid vs weak base ✓
- Example:  $\text{CH}_3\text{COOH}$  with  $\text{NaOH}$



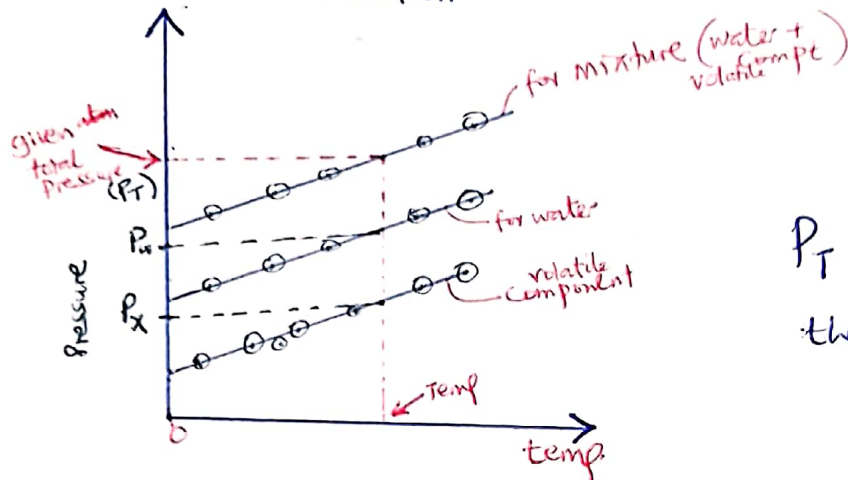
pH at endpoint =  $\frac{10+6}{2}$

# ④ PHYSICAL EQUILIBRIA.

(a) Eutectics ✓

(b)  $\left\{ \begin{array}{l} \text{Vap. pressure composition diag} \\ \text{Bpt composition diag} \end{array} \right\}$  for  $\left\{ \begin{array}{l} \text{Ideal solns} \\ \text{Deviations from Raoult} \end{array} \right\} \rightarrow \left\{ \begin{array}{l} \text{Negative} \\ \text{Positive} \end{array} \right\}$

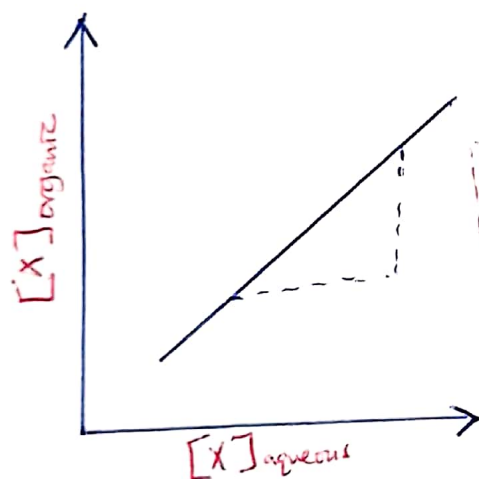
(c) Steam distillation



$$P_T = P_X + P_{\text{water}}$$

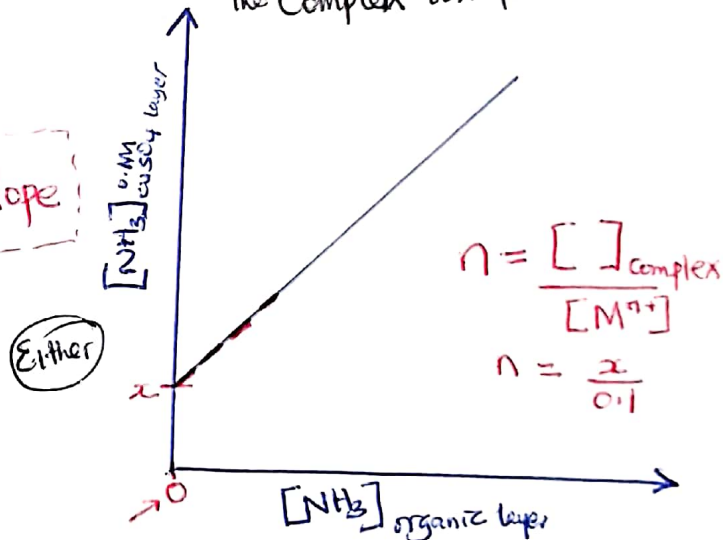
then use  $\frac{P_X}{P_{\text{water}}} = \frac{m_X \cdot M_{\text{water}}}{m_{\text{water}} \cdot M_X}$

(d)  $K_D$

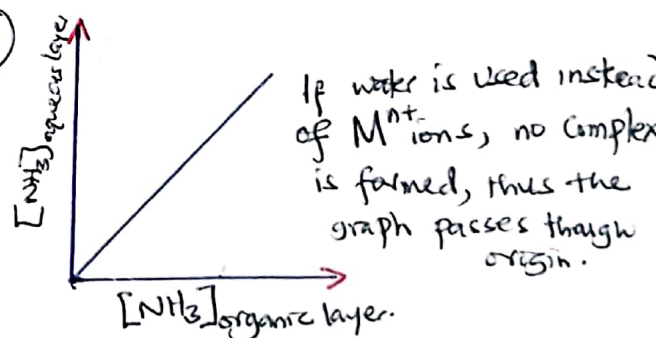


$K_D = \text{slope}$

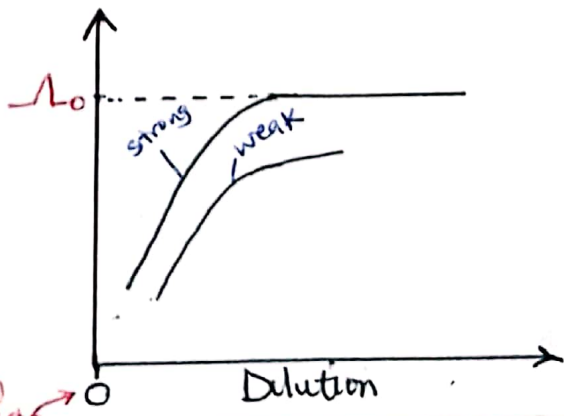
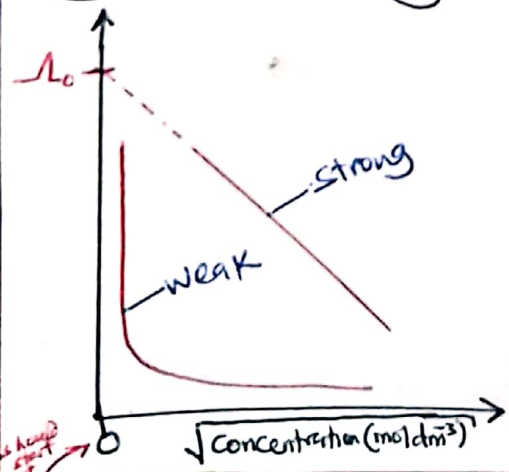
Determination of value of  $n$  in the Complex ion formed.



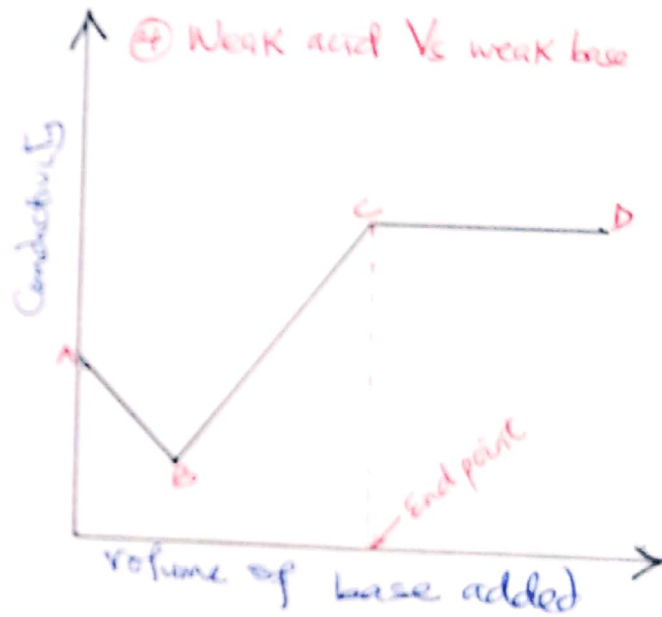
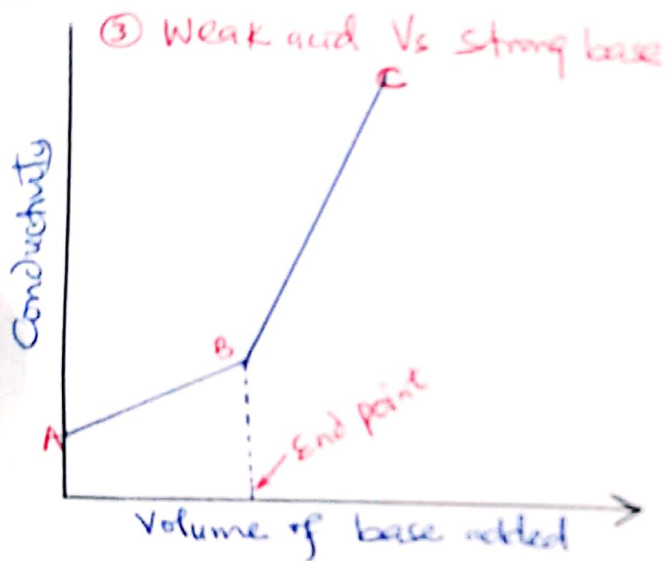
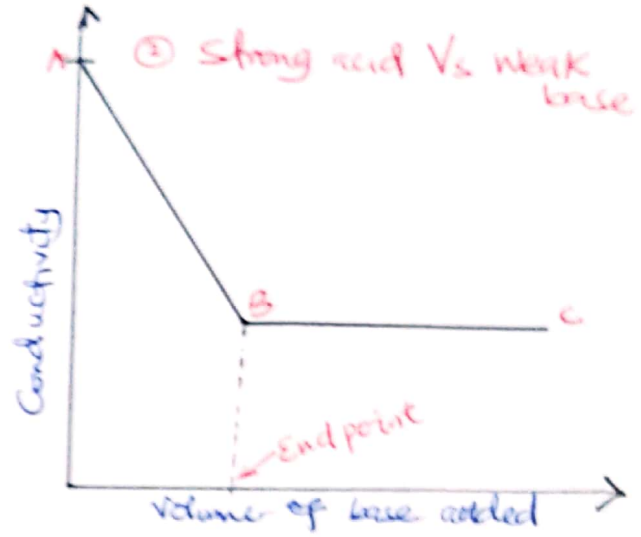
OR



⑤ Conductivity



conductivity curves.



Success Fear Candidates.



~~Kib~~  
KIBUGO DENNIS