



Lab.343

Experiment (6)

Alkaline hydrolysis of ethyl acetate
(conductance method)

Electrical conductivity

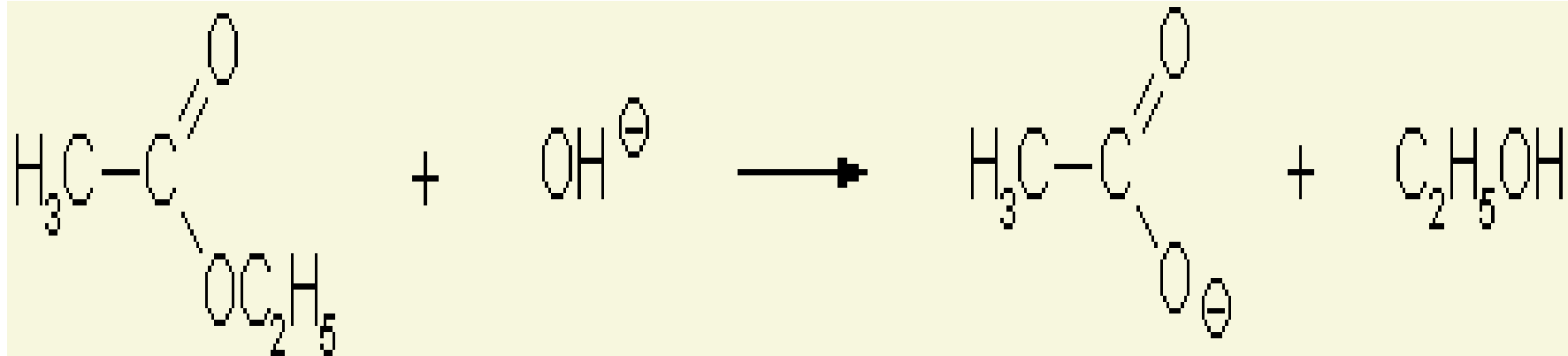
A measure of the ability of an aqueous solution to conduct electricity



Electrolytic Properties

- ▶ Electrolyte solution: contains a number of ions.
 - ❑ Strong electrolyte . Ex NaOH
 - ❑ weak electrolyte . Ex CH_3COOH
- ▶ Nonelectrolyte solution: does not contains a ions.

Ex. $\text{C}_2\text{H}_5\text{OH}$



ethyl acetate

hydroxide ion

C_0

acetate ion

C_∞

ethanol

Second order reaction equation

$$1/a-x = Kt + 1/a$$

$$Kt = 1/(a-x) - 1/a$$

$$Kt = a - (a-x) / a(a-x)$$

$$Kt = x / a(a-x)$$

$$Kt = x / A_0(A_0-x)$$

$$x / A_0(A_0 - x) = Kt$$

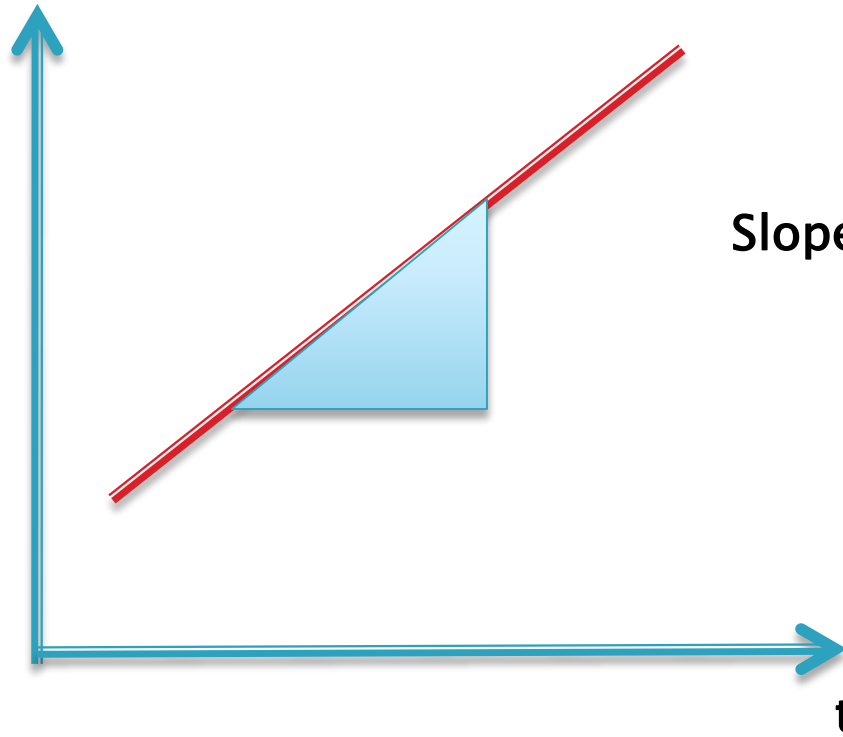
$$A_0 \equiv C_0 - C_\infty$$

$$X \equiv C_0 - C_t$$

$$C_0 - C_t / A_0 (C_0 - C_\infty - (C_0 - C_t)) = Kt$$

$$C_0 - C_t / A_0 (C_t - C_\infty) = Kt$$

$$C_0 - C_t / C_t - C_\infty$$



$$\text{Slope} = K A_0$$

Prepare:

concentration	Volume	Liquid	Solid
0.05M	<u>100</u> ml	CH ₃ COOC ₂ H ₅	NaOH
0.01M	100ml	CH ₃ COONa	NaOH

Procedure:

1- Measure the conductance of 0.01M NaOH & CH_3COONa at room temp.

2-

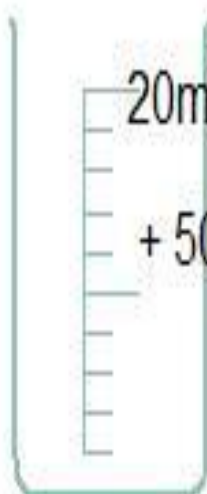
20ml ester(0.05M)

+ 10ml H_2O



20ml NaOH(0.05M)

+ 50ml H_2O



3- Mix the two solutions , shake thoroughly, place the conductance probe in the mixture and take readings of the conductance



t	C_t (μs)	C_0	C_∞	$C_0 - C_t / C_t - C_\infty$
1				
3				
5				
7				
9				
11				
13				
15				
17				
19				
22				
25				
30				
35				
40				
45				