IARE

INSTITUTE OF AERONAUTICAL ENGINEERING

(An Autonomous Institute affiliated to JNTUH, Hyderabad)

Dundigal, Hyderabad - 500 043

LABORATORY WORK SHEET

Name of the Student .....

Class..... Semester.....

Course Code :.....Course Name :.....

Roll Number										
										-

Name of the Course Faculty.....Faculty ID :.....

Exercise Number :.....Week Number :.....Date :.....

DAY TO DAY EVALUATION:

Marks	Aim / Preparation	Algorithm / Procedure	Source Code	Program Execution	Viva - Voce	Total
		Performance in the Lab	Calculations and Graphs	Results and Error Analysis		
Max. Marks	4	4	4	4	4	20
Obtained						

Signature of Faculty

START WRITING FROM HERE :

Estimation of an HCl by conductometric titrations

Aim :

Determine the neutralization point of strong acid against strong base conductometrically.

Apparatus :

Digital conductivity meter, conductivity cell, Burette, Beakers, Measuring cylinder burette stand etc.

Chemicals required :

Sodium hydroxide, Hydrochloric acid.

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Principle :

At first solution contains H^+ and Cl^- ions. Since H^+ ions possess greater mobility it follows that the conductivity is mainly due to H^+ ions. The addition of NaOH is represented by the equation.

$$HCl + NaOH \rightarrow NaCl + H_2O$$

As NaOH is added, the H^+ ions are removed. The conductivity decreases as Na^+ ions do not process much mobility. As the neutralization point and solutions contains Na^+ ions and Cl^- ions and will have minimum conductance value. If NaOH is further added this will add OH^- ions and so the conductivity increases.

Procedure :

A standard solution of 0.2 N NaOH is prepared. similarly 0.1N HCl is prepared. 20 ml of HCl is taken in a 100 ml beaker and to it, 20ml of distilled water is added and kept in a thermostat. The conductivity cell is washed with distilled water and rinsed with acid solution. The cell is kept in acid containing beaker and it is connected to the bridge. The conductivity of the solution is measured by adjusting the reading. NaOH soln is taken into burette and add 1ml of soln. to acid, Stirred well and conductance is measured. Each time 1ml of base is added to acid, stirred well and the

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conductance is measured. For every instance, Equal numbers of values are taken on either side of the point of maximum. Repeat the procedure of addition of 1 ml NaOH and noting the conductivity of the resulting solution. Take 20-25 readings.

Calculations :

S.no.	Volume of NaOH (ml)	Observed Condutance (ms)
1	0	8.7
2	1	7.9
3	2	6.8
4	3	5.9
5	4	5.1
6	5	4.1
7	6	3.2
8	7	2.8
9	8	3.2
10	9	3.8
11	10	4.3
12	11	4.8
13	12	5.2
14	13	5.6
15	14	6.0
		6.4

Formula : $N_1V_1 = N_2V_L$ $\quad M_1 = \frac{M_2V_L}{V_1} = \frac{0.2 \times 6.8}{40} = 0.034$

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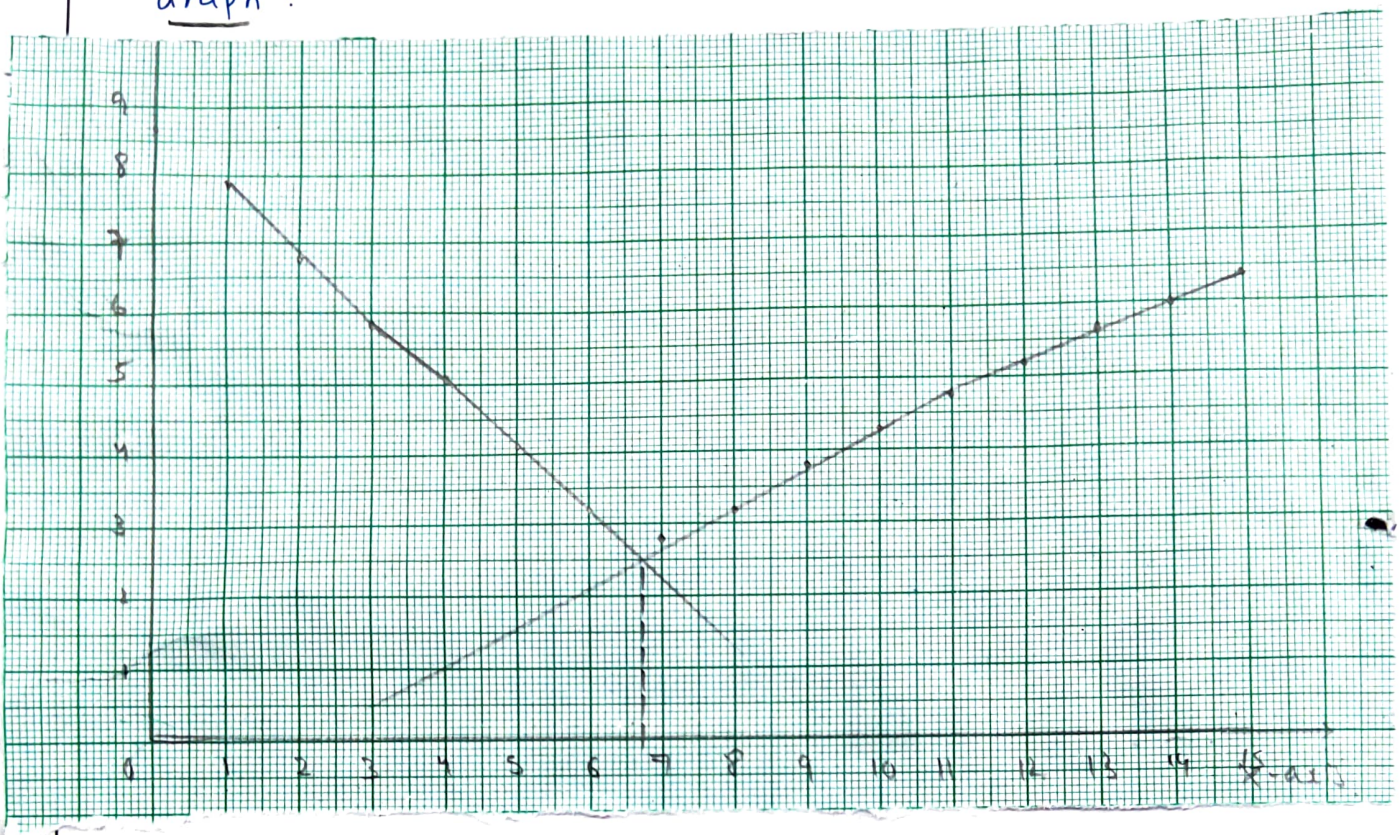
Graph :



Result:

The normality of strong acid (HCl) determined by titrating against a strong base (NaOH) = 0.034 N