Date

Expt. No. 7

Page No.

DETERMINATION OF THE STRENGTH OF A MIXTURE OF ACETIC ACID AND HYDROCHLORIC ACID BY CONDUCTOMETRY.

★ AIM:

→ To estimate the strength of the mixture of acetic acid and hydrochloric acid present in a given mixture by conductometrically.

★ PRINCIPLE:

→ The conductivity of the solution is related to the mobility of ions which in turn related with the size of the ions.

→ $NaOH + HCl \longrightarrow NaCl + H_2O$

$CH_3COOH + Na^+ + OH^- \longrightarrow CH_3COO^- + Na^+ + H_2O$

★ PROCEDURE:

→ The given mixture of acids is made up to 100 ml using distilled water.

→ 10 ml of this made up solution is pipetted out into clean beaker and 100 ml of distilled water is added.

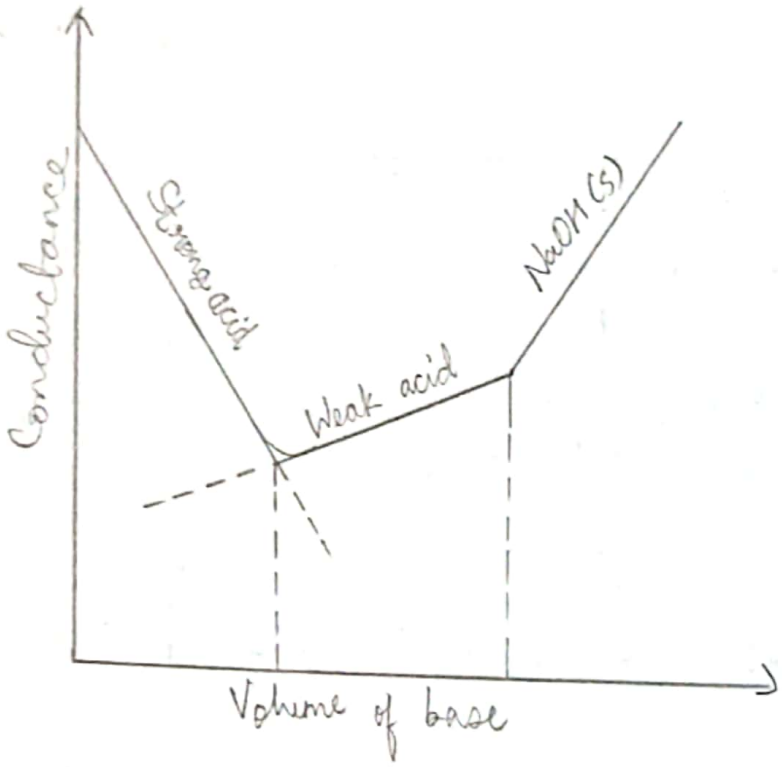
→ The conductivity cell is dipped into the test solution and titrated against NaOH (0.5 ml) interval with proper stirring.

→ The conductance is measured after each 0.5 ml addition of NaOH at various stages of neutralization.

→ After complete neutralization, the amount of acid present in the given mixture is determined based on the volume of NaOH consumed.

→ Volume of base consumed for strong acid and weak acid are determined by plotting a graph between conductance

Teacher's Signature



Date _____

Expt. No. _____ Page No. _____

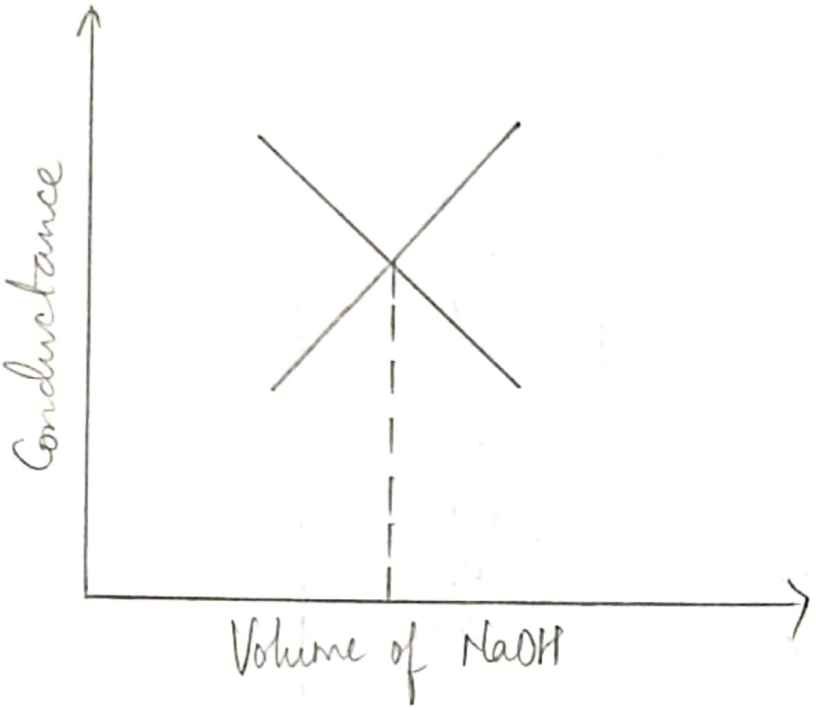
and volume of base added, where first end point corresponds to strong acid and second end point corresponds to weak acid.

★ OBSERVATIONS:

S.No.	Volume of NaOH added (ml)	Conductance (Ω^{-1})
1	9	1.736
2	9.2	1.670
3	9.4	1.605
4	9.6	1.523
5	9.8	1.503
6	10	1.424
7	10.2	1.363
8	10.4	1.320
9	10.6	1.282
10	10.8	1.270
11	11	1.236
12	11.2	1.260
13	11.4	1.302
14	11.6	1.318
15	11.8	1.370
16	12	1.383
17	12.2	1.387
18	12.4	1.449
19	12.5	1.457

(TABLE 1)
(FAIR TITRATION)

Teacher's Signature _____



Date

Expt. No. Page No.

(TABLE 2)
(PILOT TITRATION)

S.No.	Volume of NaOH added (ml)	Conductance (Ω^{-1})
1	0	4.4
2	1	4.2
3	2	3.8
4	3	3.5
5	4	3.2
6	5	2.9
7	6	2.5
8	7	2.3
9	8	2
10	9	1.853
11	10	1.498
12	11	1.215
13	12	1.283
14	13	1.40
15	14	1.552
16	15	1.704
17	16	1.843
18	17	1.973

* **CALCULATIONS:**

→ Volume of HCl (V_1) = 10ml

Normality of HCl (N_1) = $\frac{V_2 N_2}{V_1} \Rightarrow \frac{11 \times 0.1}{10} \Rightarrow 0.11N$

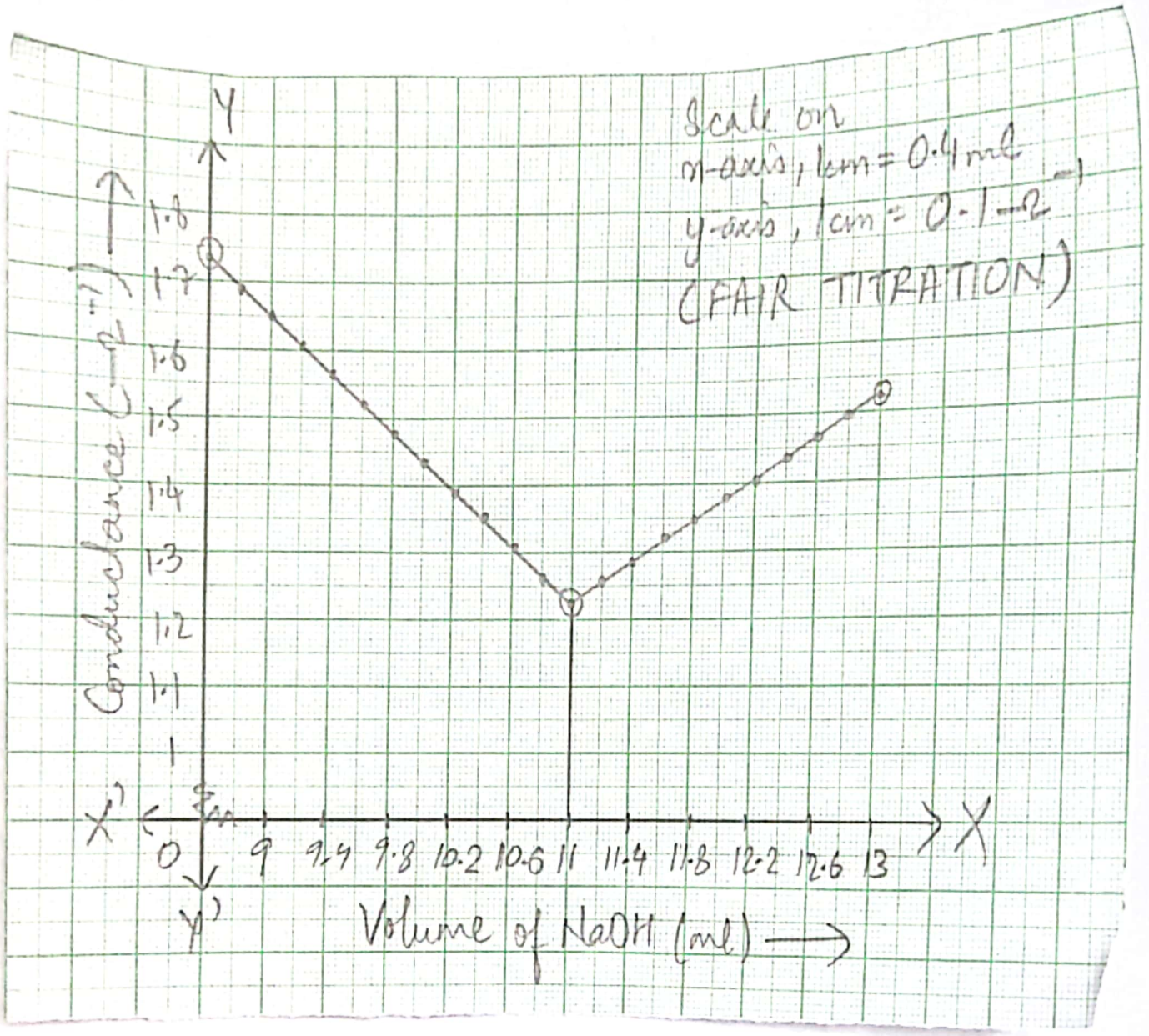
Volume of NaOH (V_2) = 11 ml (from graph)

Normality of NaOH (N_2) = 0.1N

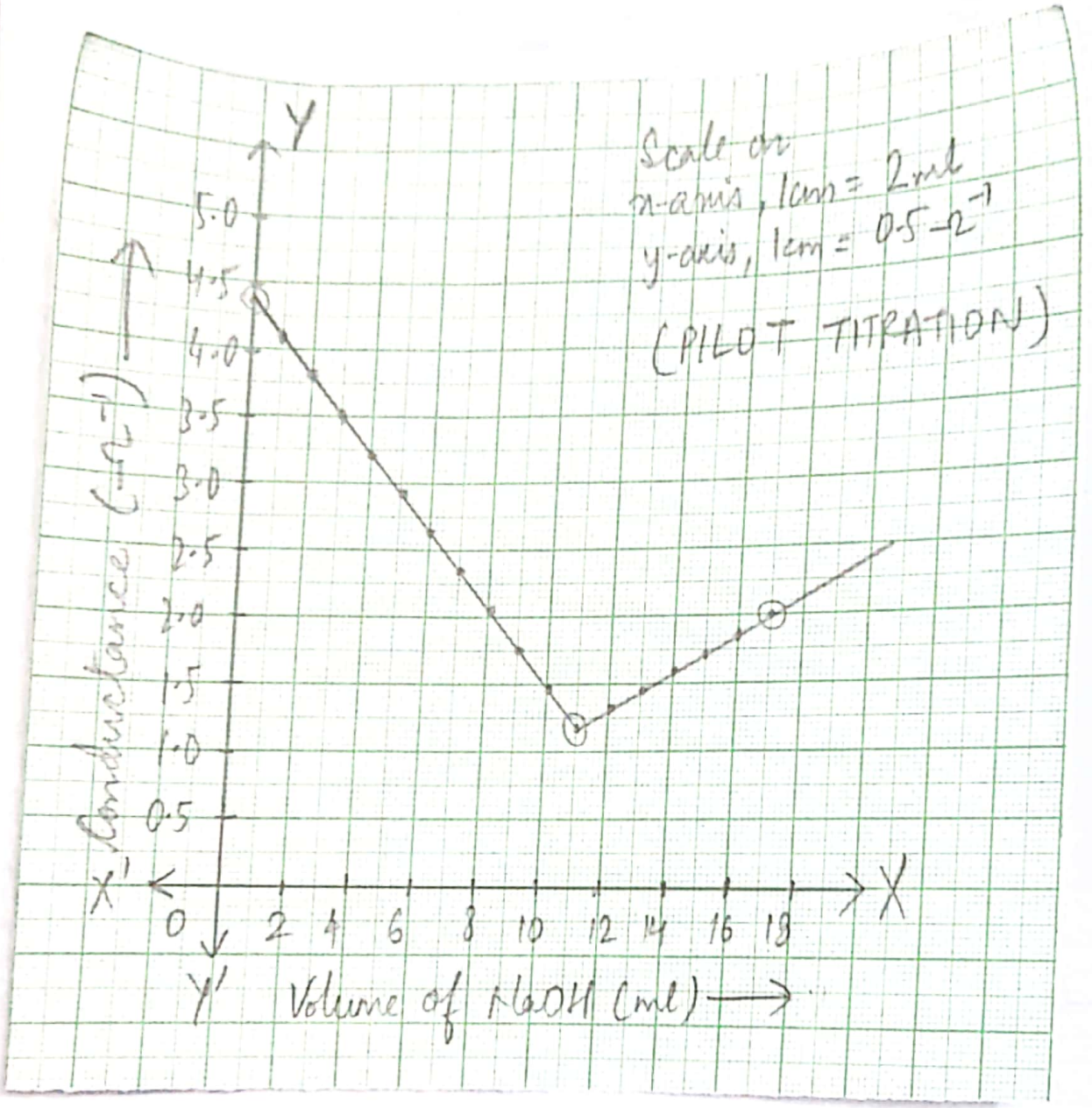
Strength of HCl acid = 0.11N //

Teacher's Signature

★ GRAPH :



★ GRAPH :



Date _____

Expt. No. _____ Page No. _____

★ RESULT:

→ The strength of given HCl solution = 0.11 N //

— X —

Teacher's Signature _____