

Model Procedure / Flow Chart:

Pipette out 50 cm^3 of acid solution into a beaker.

Fill the burette with NaOH .

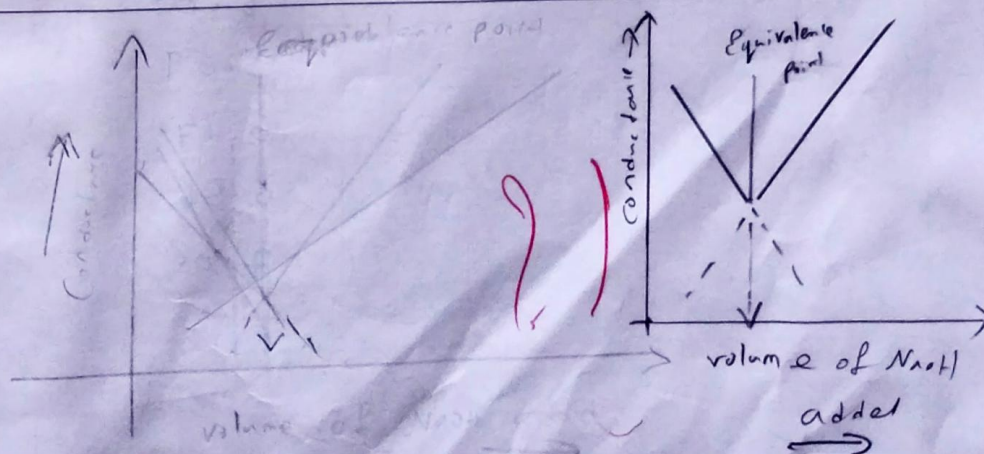
Immerse the conductivity cell in such a way that the 2 electrodes touch bottom of the beaker.

Connect the cell to conductivity bridge and measure the conductance.

Run down 0.2 cm^3 of NaOH & measure the conductance after each addition. In the beginning the conductance decreases and then it suddenly increases. Plot a graph of conductance vs volume of NaOH added to it.

Determine the volume of NaOH required to completely neutralize ~~assumed~~ HCl from the graph and find the Normality & amount of HCl in 1000 cm^3 of solution.

Model graph:

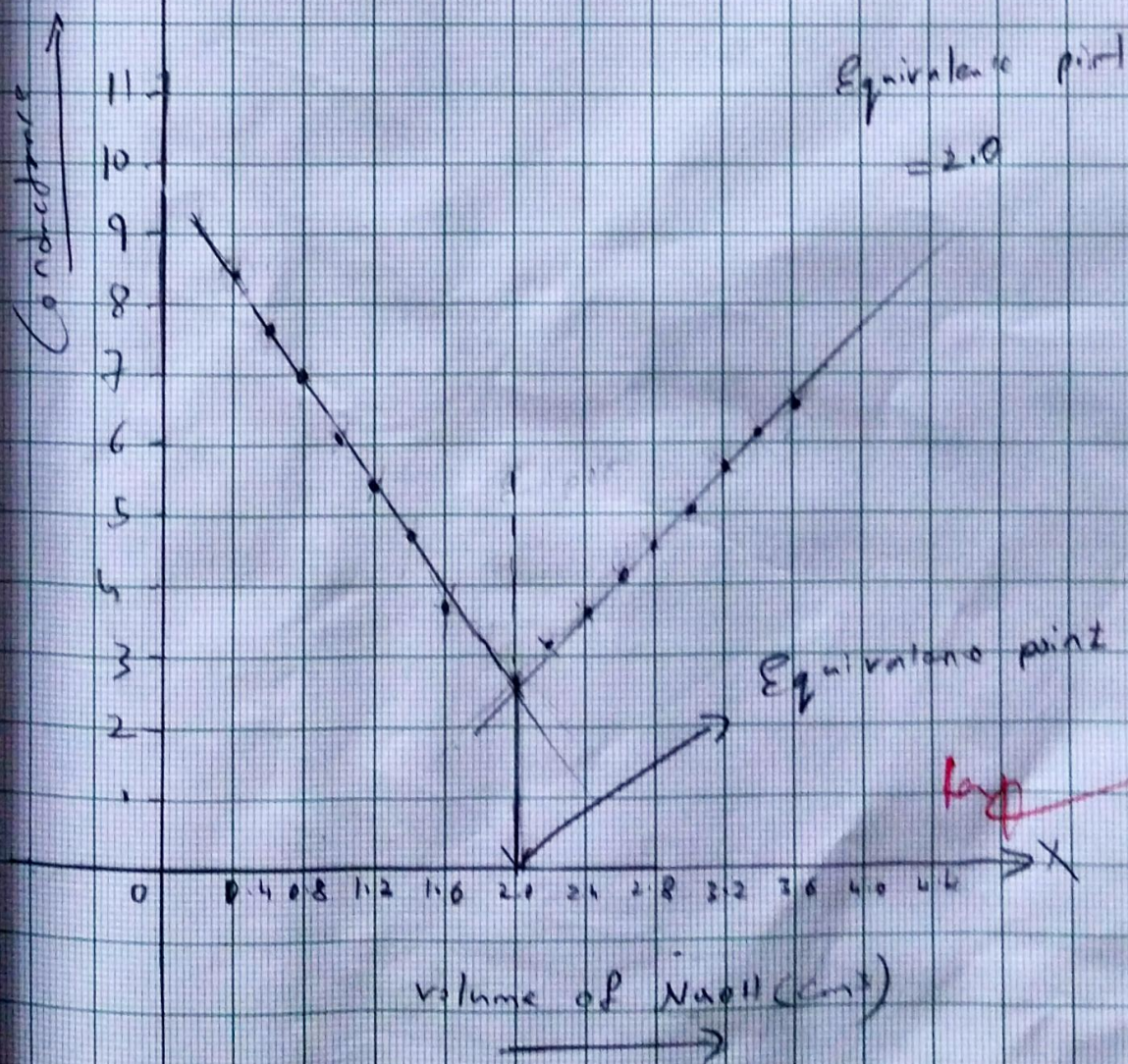


Tabulation:

Volume of NaOH in cm^3	Conductance in mS
0.0	9.88
0.2	9.12
0.4	8.44
0.6	7.53
0.8	6.96
1.0	6.12
1.2	5.46 5.41
1.4	4.70
1.6	3.65
1.8	3.22
2.0	2.73
2.2	3.12 3.16
2.4	3.63
2.6	4.10 4.11
2.8	4.55
3.0	5.05
3.2	5.69
3.4	6.17
3.6	6.56
3.8	7.06

scale

x-axis $\rightarrow 1\text{cm} = 0.4\text{cm}^3$
y-axis $\rightarrow 1\text{cm} = 1\text{unit}$



Calculation:

$$(N_1 V_1)_{\text{HCl}} = (N_2 V_2)_{\text{NaOH}}$$

$$(N_1)_{\text{HCl}} = \frac{(N_2 V_2)_{\text{NaOH}}}{(V_1)_{\text{HCl}}}$$

$$(N_1)_{\text{HCl}} = \frac{0.05 \times 1.84}{50}$$

$$(N_1)_{\text{HCl}} = 0.002 \text{ N}$$

Amount of HCl present in 1 cm^3 of its solution

$$= (N)_{\text{HCl}} \times \text{gram equivalent weight of HCl}$$

$$= 0.002 \times 36.5$$

$$= \cancel{0.0073 \text{ g}} = 0.073 \text{ g}$$

Inference:

The Normality of HCl is 0.002 N

~~The~~ HCl is a strong acid. When NaOH is added, it completely reacts completely dissolved and graph increases

The equivalence point is at 2.00 cm^3

Relevance to society & environment:

- Can be used to check pollution levels in water bodies
- It can be used in food industry, to trace various microbes.
- used in pharmaceutical industries to detect antibiotics and to check the levels of basicity of various acids.

Report:

1. Normality of the HCl = 0.002 N
2. Amount of HCl present in the given solution = 0.073 g

Evaluation of Experiment -5		
	Marks	
	Max	Obtained
Model Procedure, Model Graph & Calculation	16	16
Equivalence Point & Execution	20	19
Inference & Societal Relevance	04	03
Total	40	38
Signature of Teacher		