

Date:- 9th nov, 2020

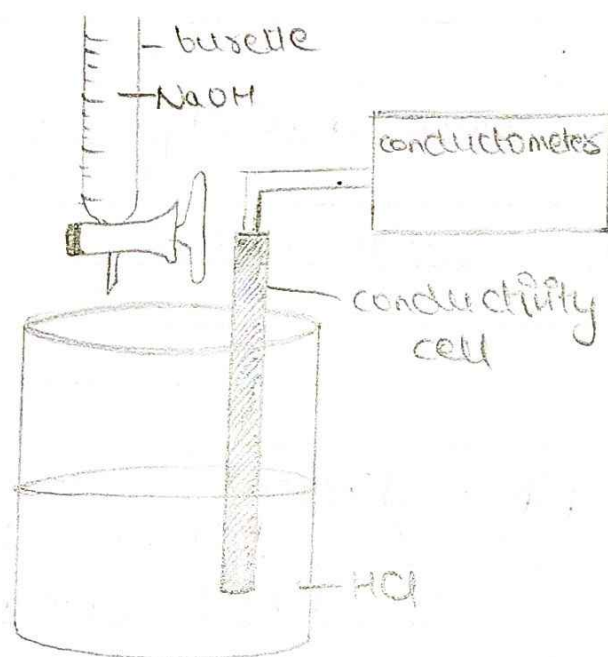
Experiment No. - 07

Experiment: Determine the strength of sodium hydroxide solution by titration with standard hydrochloric acid (0.1N) conductometrically.

Apparatus: Pipette, burette, beakers, funnel, burette stand and clamp, conductometer and conductivity cell.

chemicals required: Standard HCl and NaOH.

Chemical Reactions:



Experiment - 07

→ Aim:-

Determine the strength of sodium hydroxide solution by titration with standard hydrochloric acid (0.1N) conductometrically.

→ Theory:-

There is a decrease in H^+ ion concentration upon addition of NaOH solution to the HCl solution, resulting in decrease in conductivity of the solution.



During titration, conductivity of solution first decreases upto equivalence point, then increases due to increase in hydroxyl ion concentration. After the neutralisation is complete, further addition of alkali would result in increase of conductance, since the additional OH^- ions from NaOH are no longer used up in the chemical reaction. So, if we plot conductivity versus volume of titrant/NaOH, we get V shaped curve. From the titration curve an equivalence point can be obtained.

→ Procedure:-

- (1) Take some of HCl solution in a clean beaker and immerse/dip the conductivity cell in it. Make sure that the two platinum electrodes of the cell are

Teacher's Signature _____

Nowhay

Observations :

Volume of 0.1N HCl taken in the beakers = 50 mL

Volume of NaOH added from the burette (mL)		Conductivity (milli mho)
1)	0.5	26.8
2)	1	24.6
3)	1.5	22.9
4)	2	21.1
5)	2.5	19.3
6)	3	17.5
7)	3.5	15.6
8)	4	11.2
9)	4.5	10.1
10)	5	9.1
11)	5.5	10.6
12)	6.0	12.2
13)	6.5	13.7
14)	7	15.0
15)	7.5	16.2
16)	8	17.4
17)	8.5	18.9
18)	9	20.4
19)	9.5	22.7
20)	10	23.8
21)	10.5	24.8
22)	11	26.2

- completely dipped in the solution.
- (2) Connect the cell to the bridge. Note down the conductivity.
 - (3) Add NaOH from the burette ~~no~~ at an interval of 0.5 ml each time, stir the contents and note down the conductivity every time. The conductivity will first decrease and then increase.
 - (4) Plot the conductance against volume of NaOH added. The equivalence point can be determined from the intersection of two lines on the graph and hence the strength of NaOH solution can be calculated. This procedure can also be applied to find the strength of mixtures of two acids or bases and also in the precipitation titration.

→ Result:-

The strength of sodium hydroxide present in the given sample is 40 g/L.

→ Precautions:-

- (i) Rinse the ~~pe~~ pipette / burette with the solution to be transferred to the titration flask / burette.
- (ii) Do not rinse the titration flask.

Teacher's Signature _____

(Nobhav)

Applying normality equation:-

$$N_{NaOH} = \frac{N_{HCl} \times 50}{A}$$

$$= \frac{0.1 \times 50}{5} = 1$$

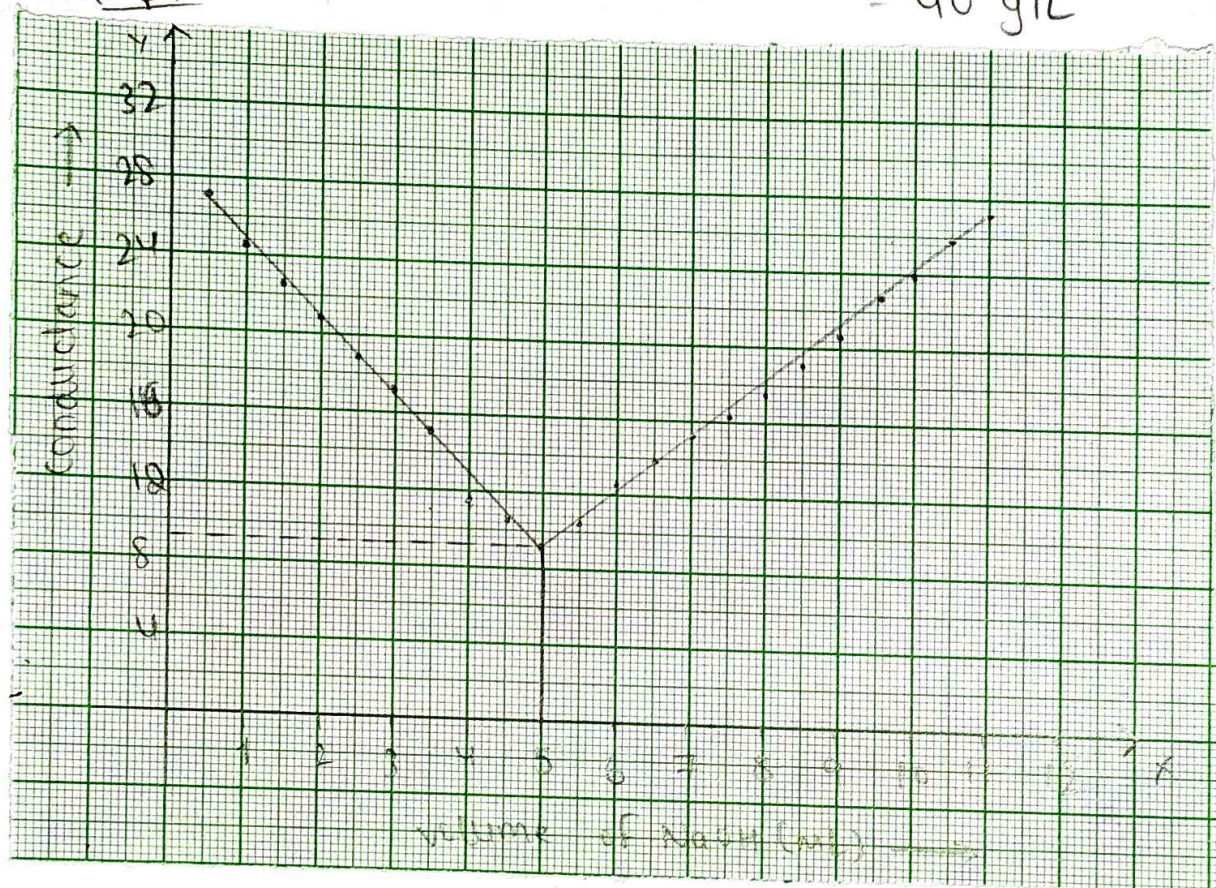
A → volume of NaOH at point A (acc. to graph)

$$\text{Strength of NaOH (g/L)} = \text{Normality} \times \text{Eq. wt.}$$

$$= 1 \times 40$$

$$= 40 \text{ g/L}$$

Graph:-



Result:-

The strength of sodium hydroxide present in the given sample is 40 g/L

(Northan)