Experiment-5

NAME: MAJJIGA JASWANTH
REGNO: 20BCD7171

Title: Conductivity Measurement: Effect of Ion Mobility and Concentration

Aim: To Study

1) The Concentration of various electrolyte Solution.
2) Conductance of anyone electrolyte at various Solutions concentration
3) Conductance of anyone electrolyte Solution at various temperatures

Materials Required:-

1. (i) HCl acid (ii) NaCl salt (iii) KCl salt (iv) deionised water
2. Conductometer, 110°c thermometer, Electrical hot plate
3. 100ml measuring jar, 20 ml pipette, 250ml Beakers, 500ml Beaker (waterbath), glass rod

Procedure:-

1. Prepare 100ml aqueous Solutions of HCl, NaCl and KCl in 0.1M Concentration.
2. Measure the Conductance of each Solution at Same temperature. Record in table
3. take exactly 100ml aqeous 0.1M NaCl Solution and measure Conductivity.

4. Add exactly 20ml of deionized water, mix throughly and measure the Conductivity.

5. Repeat the above step four times (solution Volume changes from 100ml : 120, 140, 160, 180, 200ml) and record Conductance of Solution in table.

6. Measure the Conductivity of 0.1M KCl Solution at room temperature. use a hot water bath and measure the Conductivities at 4 or 5 different temperatures.

Observation:

Table: 1

Conductivity Measurement: Effect of Ion mobility and Concentration.

S/No	Concentration	Specific Conductance.	Temperature
1	0.1M HCl	37.52.	298K
2	0.1M HCl	10.75	298K
3	0.1M HCl	12.28	298K
4	0.1M HCl	14.21	298K.

Table:2 Variation of Conductance w.r.t to NaCl Solution Concentration

S/No	Volume of NaCl (ml)	concentration (c)	Specific Conductance ms/cm	Temperature
1	100 ml	0.1000M	12.28	298K
2	100+20 ml	0.0833M.	10.27	298K
3	120+20ml	0.0714M	8.89	298K
4	140+20ml	0.0625M	7.86	298K
5	160+20ml	0.0556M	7.01	298K
6	180+20ml	0.0500M	6.38	298K

Result:

from the above date.

table:1

The cation which has the highest Conducting ability is 37.52

The Conducatance decreases with decrease in NaCl Solution Concentration.

Question and Answers:

1)A) Molar Conductance is dependent on Concentration of the electrolyte. when the Solution is dilute the number of ions available per unit volume. reduces, resulting in reduce of the Conductivity

2)A) In theory, the pH of 0.1 M HCl solution should be 1.0 (strongly acidic)... Although both Solutions were 0.1M in Concentration, HCl is strong acid and is fully ionized, whereas acetic acid is a weak acid and only partially acidic

3)A) As the temperature increases electrolyte Conductivity also increases because with the increase in temperature ionisation increases and also the movement of ions.