# S U M M A R Y

## SUMMARY

Molar conductance measurements of the ammonium chloride, dimethyl ammonium chloride and tetramethyl ammonium chloride in mixed aqueous solvents such as ethanol-water methanol-water and acetone-water have been carried out. The composition of the non-aqueous solvents used were 0, 10, 20, 30, 40, 50, 60, 70, 80 and 90 % . The molar conductance measurements have been carried out at six different temperatures from 5 to 30°c at an interval of 5°c. The concentrations used for ammonium chloride in ethanol-water system were $1 \times 10^{-2}$ M, $1 \times 10^{-3}$ M, $5 \times 10^{-4}$ M, $1 \times 10^{-4}$ M for dimethyl ammonium chloride and tetramethyl ammonium chloride in ethanol-water system $1 \times 10^{-4}$ M, $5 \times 10^{-5}$ M and $1 \times 10^{-5}$ M concentrations were studied. In methaol-water system $1 \times 10^{-2}$ M, $5 \times 10^{-3}$ M and $1 \times 10^{-3}$ M concentrations were studied for all the three electrolytes, while $1 \times 10^{-2}$ M $1 \times 10^{-3}$ M and $5 \times 10^{-4}$ M concentrations were used for acetone-water system.

The results obtained show that the molar conductance values pass through minimum at lower temperatures 5 and 10°c for the concentrtions $1 \times 10^{-4}$ M and $5 \times 10^{-5}$ M for ammonium chloride in ethanol-water mixed solvents, there is regular decrease in molar conductance at

15, 20, 25, and 30°c. For 1 x $10^{-2}$M, 1 x $10^{-3}$ M and 5 x $10^{-4}$ M concentrations there is no minimum in molar conductance for ammonium chloride. For dimethyl ammonium chloride minimum in molar conductance is observed only at 5°c for 5 x $10^{-5}$ M concentration and at 5, 10 and 15° c for 1 x $10^{-5}$ M concentration. Similarly the minimum in molar conductance is observed at 5, 10 and 15°c for 5 x $10^{-5}$ M and 1 x $10^{-5}$ M concnetrations for tetramethyl ammonium chloride in ethanol-water solvents.

In the system methanol-water the molar conductance values pass through minimum not only at low temperature but at all the temperatures studied from 5 to 30°c and for all concentrations studied viz. 1 x $10^{-2}$ M, 5 x $10^{-3}$M and 1 x $10^{-3}$M for all the three electrolytes studied.

In the case of acetone-water system, no minimum in molar conductance has been observed even at low temperatures for the concentration 1 x $10^{-2}$ M for ammonium chloride and dimethyl ammonium chloride but molar conductance values pass through minimum for 1 x $10^{-2}$ M concentrations for tetra methyl ammonium chloride. Minimum is observed for 1 x $10^{-3}$ M and 5 x $10^{-4}$ M concentrations at all the temperatures studied and for all the three electrolytes studied.

It has been observed that molar conductance values of ammonium chloride in ethanol-water, methanol-water and acetone-water obey the order :

acetone-water > methanol-water > ethanol-water

upto 60 % of non-aqueous solvent. The order changes beyond 60 % as :

methanol-water > acetone-water > ethanol-water.

Each system studied at six different temperatures namely 5, 10, 15, 20, 25 and 30$^{o}$ c indicate that the molar conductance varies linearly with temperature.

The study of molar conductance of ammonium chloride, dimethyl ammonium chloride and tetra methyl ammonium chloride in ethanol-water, methanol-water and acetone-water mixed solvents has revealed that it obeys in general the order :

$NH_4Cl$ > $Me_4NCl$ > $Me_2NH_2Cl$

The results of volume contraction indicate that volume contraction is independent of the nature of electrolyte and the concentration of electrolyte. It has been found that volume contraction is constant in the composition range 40 to 70 % of non-aqueous solvents.