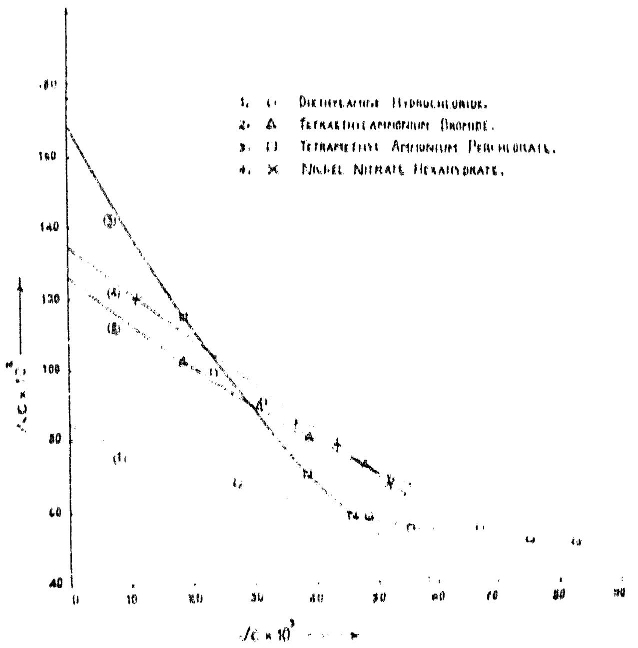
CONDUCTANCE OF SALTS IN DIETHANOLAMINE AS A NON-AQUEOUS SOLVENT

THE study of conductance in non-aqueous solvents has been made by a number of workers both for understanding the nature of these solutions and also for testing the various theories of conductance that have been developed in this field. But for systems where the solvent is very viscous and also where solvent molecules are large or of the same order of magnitude as the solute molecules, little work has been done.[1] In this note data for the electrical conductivity of solutions of a number or organic and inorganic electrolytes, *e.g.*, tetraethylammonium bromide, tetramethyl ammonium perchlorate, diethylamine hydrochloride and nickel nitrate in a very viscous solvent, diethanolamine $(C_2H_4OH)_2$ NH, have been recorded. Diethanolamine should behave both as an alcoholic solvent as well as a strong ammoniacal base and has a viscosity, $\eta = 3 \cdot 676$ poise at 30° C.

The Debye-Hückel-Onsager's equation[2] $\lambda_c = \lambda_0 - x\sqrt{c}$ (where λ_0 = equivalent conductivity at infinite dilution, λ_c = equivalent conductivity at concentration c and x = Onsager's slope), has been applied to get an approximate value of λ_0 in every case. For this, λ_c was plotted as ordinate against $\sqrt{c}$ and a freehand curve or a straight line as the case may be was drawn as shown in the figure. From these



graphs λ_0 was obtained by extrapolating to zero-concentration of the electrolyte and the values are recorded in the following table.

Temperature 30° C.

Solvent = Diethanolamine ($\eta = 3 \cdot 676$ poise)

Electrolyte	$\lambda_0 \cdot 10^2$
$(C_2H_5)_4N\ Br$	126·0
$(CH_3)_4N\ ClO_4$	168·0
$(C_2H_5)_2NH.HCl$	84·5
$Ni(NO_3)_2 \cdot 6\ H_2O$	134·5

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Further work is in progress.

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ON THE SUITABILITY OF THE DIELECTRIC CONSTANT METHOD FOR THE DETERMINATION OF MOISTURE IN LAC

THE moisture content of lac usually varies from about 1 to 3 per cent. depending mostly on the humidity of the atmosphere. Although the range of variation may appear to be small, its determination is often necessary since it influences some of the important physical properties, such as fluidity,[1] solubility,[2] polymerisability, etc. The usual method of drying a substance to constant weight at 100° C. or above is not applicable to lac since it easily gives off its combined water at such high temperatures resulting in a partially polymerised product. Other methods[3] involve the employment of vacuum desiccation at lower temperatures. But as all these methods are cumbersome and time-consuming, the need for a rapid, reproducible and accurate method for the determination of moisture in lac, has always been felt.

The results of experiments with a specially designed cylindrical condenser showed, however, that there is practically no increase in capacitance till the moisture content rises from zero to about 1·4 per cent. (moisture determinations being made by the I.L.R.I. method[4]). A further increase in the quantity of moisture in lac results in a slow but gradual rise in the value of capacitance of the experimental condenser till almost the saturation point of moisture is reached, when, however, a rapid increase in capacitance can be observed. The following table embodying the results of measurement on a sample of powdered kusum lac illustrates this.

Moisture content of lac (percentages after conditioning at different humidities)	Capacitance of the condenser in micro-micro-farad at the frequency of	
	100 kc/s	1 kc/s
0·00	56·0	72·0
0·75	56·0	72·5
0·88	56·0	72·0
1·26	56·5	72·0
1·43	56·0	72·5
1·52	56·5	73·0
1·70	57·0	74·0
2·25	60·5	76·0
2·62	66·0	82·5