ELECTRICAL CONDUCTIVITY OF SOLUTIONS IN AMYL AMINE

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BY

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A considerable amount of work has been done in investigating the electric conductivity of solutions, both aqueous and non-aqueous. From the behavior of the former class of solutions the conclusion has been drawn that the greater the dilution, the greater the degree of dissociation of the molecules, hence the greater the electrical conductivity. But upon the study of the behavior of non-aqueous solutions, which have been found to digress from this theory of electrolytic dissociation upon increase of dilution, a question has been raised as to the validity of the assumption which the theory presupposes. Hence it would seem that some amendment, at least, should be added to the affirmation at present made in regard to the electrical conductivity of solutions, since the exceptions are too numerous to pass unnoticed.

Previous investigation made along this line in this laboratory, suggested that further work might be done to advantage. The work above referred to was done by O. E. Ruhoff upon solutions of silver nitrate, cadmium iodide and ferric

chloride in amyl amine. In accordance with the idea of determining the behavior of various other salts in amyl amine, the results given below were obtained.

The method used for taking the measurements was that of Kalrausch.[1] The method of dilution and the form of cell used were the same as those employed by Ruhoff.[2]

Particular pains were taken to have the amyl amine and the salts free from moisture.

The specific conductivity of $\frac{N}{50}$ potassium chloride solution was taken as 0.00277 reciprocal ohms at 25 degrees Centigrade. The results in any case are not corrected for the conductivity of the solvent. The last measurement in each case of the amyl amine solutions, is that of the saturated solution. A few preliminary quantitative measurements were made of the conductivity of some aqueous solutions which had already been determined, as sodium chloride and copper sulphate. The specific conductivity of the water used was 7.71×10^{-6} reciprocal ohms. The resistance capacity of the cell or the constant, K, was 0.24108. The measurements were made at 25 degrees Centigrade.

The abbreviations used throughout the paper indicate the

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[1] Ostwald : Physico-chemical measurements.
[2] O. E. Ruhoff : B. S. Thesis,- The Electrical Conductivity of Solutions in Amyl Amine.

following: t the temperature, k the resistance capacity of the cell, sp. c. the specific conductivity, v the volume, in cubic centimeters, of the solution containing one gram molecule of the salt; M_v the molecular conductivity.

COPPER SULPHATE			SODIUM CHLORIDE		
Sp. C.	V.	M_v	Sp. C.	V.	M_v
.000203	647,589	131.4	.00077	163,284	126.1
.000426	310,303	132.2	.00382	30,337	115.8
.000766	144,607	110.8	.00466	24,564	114.5
.000895	118,210	105.8	.00568	19,756	112.2
.001124	86,596	97.3	.00786	13,982	109.9
.001872	46,113	86.3			
.002840	26,837	76.2			
.003804	18,479	70.3			
.004660	14,377	66.9			
.006523	9,262	60.4			
.008349	6,739	56.3			
.01174	4,648	54.6			
.016947	2,734	46.3			
.019493	2,265	44.2			