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## NON-AQUEOUS SOLUTIONS<sup>1</sup>

By Professor CHARLES A. KRAUS

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### I. INTRODUCTION

I HAD hoped to discuss the chemical, as well as the physical, properties of non-aqueous solutions, but upon further consideration, it became clear that any such discussion would necessarily consume far more time than I have available on this occasion. I shall, therefore, limit my discussion to the physical properties of non-aqueous solutions and, indeed, to the physical properties of solutions of electrolytes. I shall first consider the influence of the physical properties of the solvent medium upon the properties of the solutions and, thereafter, I shall discuss the influence of constitution of the electrolytes upon the properties of their solutions.

<sup>1</sup> Address of the president of the American Chemical Society, Boston, September 14, 1939.

### II. PHENOMENA DEPENDENT UPON SOLVENT PROPERTIES

*Solubility.* The solubility of ordinary, inorganic salts is chiefly determined by the chemical nature rather than by the physical properties of the solvent medium. The dielectric constant of the solvent is of secondary importance as a determining factor of the solubility in the case of ordinary, inorganic salts. Many inorganic salts, for example, are readily soluble in ethylamine, whose dielectric constant is 6.2, while there are few, if any, that are readily soluble in nitrobenzene, whose dielectric constant is 35.

The solubility of salts is of great importance in the study of solutions of electrolytes. In order to investigate the phenomena of electrolytic solutions broadly, it is necessary to dissolve a given electrolyte

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