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NON-AQUEOUS SOLUTIONS[1]

By Professor **CHARLES A. KRAUS**

BROWN UNIVERSITY

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.

[1] 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

the slide, others to the coverglass and some are lost, especially when too much tissue was used in the first place. The slide is next removed from the Petri dish, the excess alcohol quickly drained or wiped off, and the adhering tissue is covered at once with a liberal amount of euparal or its equivalent. Next the excess alcohol is drained from the coverglass and the latter is placed back on the slide, face down and in its original position. Excess euparal is blotted off and after shifting the coverglass to as near its original position as possible, the preparation is ready for study.

The advantage of the method is its simplicity and speed and the excellent preservation and staining of the chromosomes. Meiotic chromosomes are especially well shown in the rat. The alcoholic-acetic fixation leaves the tissue so soft its cells can be separated by mashing after staining with aceto-carmine. The other preliminary fixatives tried so far (Flemming, Nawaschin, etc.) leave the tissues too hard or tough to be mashed out.

In studying any aceto-carmine preparation it is desirable to use green filters, Wratten filters Nos. 61 and 62 being especially recommended with artificial light. In a pinch, a piece of green eye-shade will do.

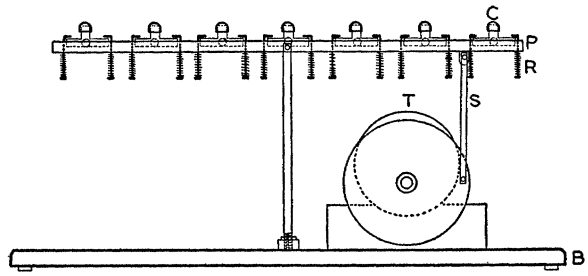
T. S. PAINTER

AUSTIN, TEXAS

A SIMPLE ROCKING DEVICE FOR CARREL FLASKS[1]

IN experiments on the artificial parthenogenesis and development of rabbit eggs *in vitro,* we have usually placed the eggs in rabbit serum in a Carrel flask and left them stationary in an incubator at 37.5° C. When the eggs are removed from the Fallopian tubes within 15 hours after the final ovulating injection of pituitary has been given, each one is found covered by several layers of granulosa cells adhering closely to the protein layer immediately surrounding the egg, and the eggs as a whole are embedded in a much larger mass of loose material of similar nature. While standing in the incubator, these cells tend to fall away from the eggs, disintegrate and spread over the bottom of the flask. While this in itself may not be deleterious, it appears to be instrumental in causing the eggs as well to adhere to the glass substratum. To avoid this, we have found the shaker, of which a side elevation is sketched in the accompanying figure, to be of definite value. Not only does it in general prevent the sticking and disintegration of this material, referred to above, but it assists the adequate and uniform oxygenation of the culture, and helps prevent local accumulation of carbon dioxide. On the whole, the condition of the eggs is definitely an improvement over that when they are left stationary. It may be of use also in oxygenating tissue cultures with large quantities of fluid, which adhere firmly after an initial growth period.

The construction is simple. On a baseboard (B), 42 × 20 cm a Telechron motor (T), giving four revolutions per minute, is mounted and attached by a 10 cm shaft (S) on the eccentric to the platform P, 8.5 × 25.5 cm, and 15 cm above the base. Seven Carrel flasks (C)



are shown held in place in depressions on the platform, by brass rods (R) bent at right angles, and fitted with springs under the platform. Each rod is covered with a short length of rubber tubing where it fits snugly against the top of the flask. The entire assemblage is kept inside the incubator during an experiment, which may last 24 to 30 hours. During this time it is regularly tilted back and forth about 30° from either side of the horizontal. The size of platform and number of flasks may of course be extended.

HERBERT SHAPIRO

CLARK UNIVERSITY

[1] Aided by a grant from the Penrose Fund of the American Philosophical Society.

BOOKS RECEIVED

ALBERT, A. ADRIAN. *Structure of Algebras; American Mathematical Society Colloquium Publications, Vol. XXIV.* Pp. xi + 210. The Society, New York.

AMBERSON, WILLIAM R. and DIETRICH C. SMITH. *Outline of Physiology.* Pp. vii + 412. 177 figures. Crofts. $4.00.

BEAUCHAMP, WILBUR L., JOHN C. MAYFIELD and JOE Y. WEST. *Science Problems for the Junior High School; Basic Studies in Science, Book 3.* Pp. x + 756. 610 figures. Scott, Foresman. $1.68.

CARROLL, FRANKLIN B. and others. *Interpreting Science; Book One, Understanding our Environment.* Pp. x + 438. Illustrated; *Book Two, Understanding our World.* Pp. xi + 554. Illustrated; *Book Three, Understanding the Universe.* Pp. xx + 712. 574 figures. Winston.

KURTZ, ALBERT K. and HAROLD A. EDGERTON. *Statistical Dictionary of Terms and Symbols.* Pp. xiii + 191. Wiley. $2.00.

MANGELSDORF, P. C. and R. G. REEVES. *The Origin of Indian Corn and Its Relatives; Texas Agricultural Experiment Station Bulletin No. 574, May, 1939.* Pp. 315. 95 figures. Agricultural and Mechanical College of Texas, College Station.

SMYTH, HENRY DE W. and CHARLES W. UFFORD. *Matter, Motion and Electricity; a Modern Approach to General Physics.* Pp. xiii + 648. 296 figures. McGraw-Hill. $3.75.

STEVENS, BERTHA, Editor. *Thoreau, Reporter of the Universe; a Selection of his Writings about Nature.* Pp. xiv + 229. Illustrated. John Day. $2.50.

THOMPSON, HOMER C. *Vegetable Crops.* Third edition. Pp. xi + 578. 68 figures. McGraw-Hill. $5.00.