

JOHN KATZMAN

THE GROWTH OF SPACE CHARGE IN THE CROOKES DARK SPACE OF A GEISSLER DISCHARGE AT LOW PRESSURES.

It was found that the space charge in the Crookes dark space of a Geissler discharge requires 10^{-3} to build in air and helium and 10^{-4} seconds in hydrogen, at low pressures. From the results obtained in air, it was shown that the product of the pressure and the mobility of the positive ion remains constant down to a pressure of 0.13 mms. of mercury. Also that the positive ions, in the initial stages of the discharge at low pressures, are formed by radiation falling on the molecules of the gas.

RUSSELL LAWRENCE KUTZ

STUDIES ON THE PHYSIOLOGY OF THE ADRENAL CORTEX.

An extensive study of the survival period of adrenalectomized rats was undertaken on account of the many inconsistent reports occurring in the literature concerning this phase of adrenal physiology. The investigation was begun with the object of determining whether or not the mortality in untreated adrenalectomized rats is sufficiently high to justify the use of such animals for assaying adrenal cortical hormone, since, by using this small species, an assay could be carried out with a smaller amount of extract than is required when adrenalectomized cats and dogs are used.

It has been shown that with few exceptions, four weeks old adrenalectomized male rats succumb to the effects of adrenal insufficiency, the majority dying with the first ten days after operation. Thus these animals may successfully be used for assay experiments. In adult adrenalectomized rats the final mortality is also very high, though they live somewhat longer than those adrenalectomized when four weeks old.

A modification of existing methods has been successfully used to obtain potent preparations of the adrenal cortical hormone. The method differs mainly in that the original extraction is made with acetone instead of alcohol and that all lipid is removed at one operation by precipitation with acetic acid instead of by the usual organic solvent fractionation.

ERNEST EDWARD MASSEY

DELTA-KETONIC ESTERS.

Methyl α , β -diphenyl- γ -benzoylbutyrate (two isomers) reacts with bromine to form four stereoisomeric methyl α , β -diphenyl- γ -bromo- γ -benzoylbutyrates. On pyrolysis two of the bromoesters give mixtures of the corresponding methyl α , β -diphenyl- γ -benzoylbutyrate, α , β -diphenyl- γ -benzoylbutyric acid, methyl 1, 3-diphenyl-2-benzoylcyclopropane-1-carboxylate and a crotonolactone. This cyclopropane, of a hitherto unknown type, is formed when hydrogen bromide is eliminated from the γ -bromoesters. Ammonia converts the cyclopropane ester into 1, 3-diphenyl-1-carbamyl-2-benzoylcyclopropane; this is easily changed to an isomer which on dehydration gives 1, 3-diphenyl-1-cyano-2-benzoylcyclopropane. The ring in the cyclic ester is opened by zinc in acetic acid forming the low melting isomer of α , β -diphenyl- γ -benzoylbutyric acid. Hydrogen bromide opens the ring with difficulty in the same position (1:2) giving the high melting stereoisomeric acid. The cyclopropane ester is sensitive to alkalis, the reaction being complex. Only one solid, a secondary product, could be isolated from the large number of oils obtained.

LEONARD PATRICK MOORE

THE ACTION OF SULPHUROUS ACID ON CELLULOSE.

The effects of acid, alkaline, and oxidation reagents on cellulose has been discussed, and the need for detailed knowledge concerning the action of sulphurous acid, on samples of cellulose from different sources, pointed out.

The various methods available for following the degradation of cellulose have been studied, and a technique for investigating the acid degradation of cellulose has been worked out.

The action of solutions of sulphurous acid on cellulose (a commercial alpha pulp and a standard cotton cellulose prepared by a special alkaline treatment) has been investigated under varying conditions of concentration of acid, temperature and time of treatment. The extent of the degradation, caused by