9. The Beckmann rearrangement in ketoximes is readily produced by the action of oxalyl chloride.

10. If organic acids or the salts of organic acids are treated with oxalyl bromide under the same conditions as in (1), organic acid bromides are produced. Several new aromatic acid bromides are described.

11. Organic acids are converted into their anhydrides by oxalyl bromide when treated as described in (6).

12. Organic acids or the sodium salts of organic acids are converted into acid bromides by the action of phosphorus pentabromide.

13. The mechanism of the reaction of oxalyl chloride with organic acids and their sodium salts is described.

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A MODIFICATION OF THE APPARATUS FOR THE DETERMINATION OF ARGININE NITROGEN BY VAN SLYKE'S METHOD.

BY GEORGE E. HOLM.

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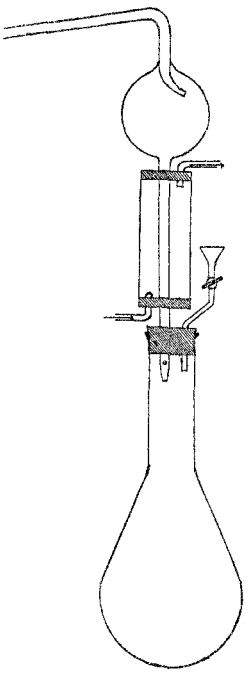
Difficulty is sometimes encountered by beginners, and even by experienced investigators at times, in the determination of arginine nitrogen of a protein hydrolysate by Van Slyke's method.[1] Even with extreme care, the use of boiling tubes, pumice, etc., cannot always prevent bumping, with the result that quite often a portion of the standard acid contained in the Folin bulb will be ejected by a sudden evolution of steam.

It has also been observed that even after cooling thoroughly upon completion of the digestion of the solution with 50% potassium hydroxide solution, a moistened strip of red litmus paper inserted into the neck of the flask will slowly turn blue (indicating ammonia). This in turn may result in a slight loss of ammonia upon the transfer of the flask to a Kjeldahl distillation rack as is required in this method of procedure given by Van Slyke. We have devised a modified apparatus which eliminates these difficulties. The apparatus requires no technique in glass blowing or new material not already on hand in a chemical laboratory.

A straight piece of glass tubing 10 cm. in length and of 3.3 cm. diameter is fitted to a Kjeldahl trap with 2 rubber stoppers as shown in the diagram. Into these rubber stoppers have previously been inserted an inlet and an outlet tube for water. This serves as a condenser for vapors during the 6 hours of digestion.

To make the apparatus suitable for an ordinary Kjeldahl rack, the neck of a Kjeldahl flask is cut off to a length of about 10 cm. In order to add the 100–200 cc. of water before the final distillation of ammonia, without

[1] D. D. Van Slyke, *J. Biol. Chem.*, 10, 15–53 (1911).



opening the system, a separatory funnel is inserted in the stopper. In using this apparatus 12.5 grams of potassium hydroxide and a few pieces of pumice stone are placed in the Kjeldahl flask. Twenty-five cc. of the "bases" is then added and the apparatus fitted upon a Kjeldahl distillation rack with a receiver containing 0.0714 *N* standard acid, as in an ordinary Kjeldahl determination (bringing exit of tube as near the surface of the standard acid as possible). During the 6 hours' digestion with potassium hydroxide a stream of water is directed through the condenser. The condenser is then drained and the system allowed to cool. From 100 to 200 cc. of water is then added through the separatory funnel, together with a small amount of zinc dust. The final distillation is now conducted as in a regular Kjeldahl determination until 100–200 cc. (depending on the volume of water added) of distillate has been collected.

The titration and calculation of the "arginine" nitrogen are carried out in the usual manner.

The advantages of this apparatus over that described by Van Slyke have already been given.

(*a*) There is no danger of loss due to "bumping."

(*b*) No break in the system or transfer of material is necessary.

(*c*) The rather expensive "Folin bulb" is eliminated.

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THE SIGNIFICANCE OF THE PEROXIDASE REACTION WITH REFERENCE TO THE VIABILITY OF SEEDS.

By J. S. McHARGUE.

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Among the various enzymes that occur in living animal and vegetable tissue perhaps none is more vital to the life process than those concerned with oxidation within the cells. This oxidation is brought about by the oxidases and the peroxidases which are widely disseminated through the living tissues of both animals and plants. During the life and growth of plants oxidases are abundant in all the tissues; however, when maturity is reached, peroxidases predominate in the seeds of most species of plants. A few species contain both oxidases and peroxidases. Sound, well-matured, fresh seeds of all the species thus far examined have shown a pronounced