

A SCRUBBER FOR AMMONIA DISTILLATES.*

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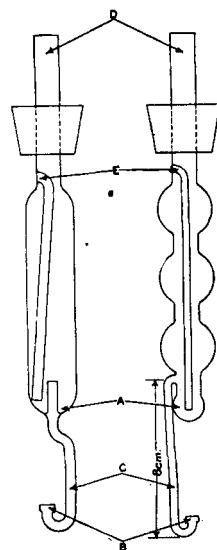
The possibility of error in the determination of nitrogen by the Kjeldahl method, owing to the mechanical carrying over of alkali from the distilling flask by the steam, is well recognized. Several types of spray traps have been devised to prevent this effect. For ordinary purposes these may be satisfactory, but where great accuracy is desired, as, for example, where very small quantities of ammonia are being estimated, many of these devices are not effective. This is particularly the case in the Devarda method for nitrates where the evolution of hydrogen causes a fine mist which carries alkali with it.

B. S. Davisson¹ devised a scrubber in which the vapors were passed through water before reaching the condenser. The device here described is merely a modification of the Davisson scrubber. In form it is like the McCoy boiling point tube.² It may also be considered as a modification of the device described by Sellier³ for the estimation of volatile acids which was recommended by Hortvet⁴ for the determination of volatile acids in wine and which is pictured on page 177 of the *Methods of Analysis of the A. O. A. C.*

For use as a scrubber the tube is made sufficiently narrow to slip easily into the neck of a Kjeldahl flask. It is connected to a condenser by means of the usual form of Kjeldahl connecting bulb as an additional precaution.

The illustrations show two constructions and the operation of the device. In starting a distillation the pocket *A* and the reservoir *B* are filled with water. The steam carrying the ammonia enters the apparatus at *E* and, after passing through the water in the pocket *A*, escapes through *D* and the connecting bulb to the condenser. The small quantity of water condensing in the bulb falls back into the pocket *A* and overflows through the tube *C*. This tube must be long enough to prevent the steam from escaping through it.

The apparatus is automatic and therefore requires no attention on the part of the analyst from the time the distillation is begun until it is completed. The quantity of water through which the vapors are scrubbed is small and is continuously changing. The device is comparatively simple to make and is therefore inexpensive.



Scrubber for ammonia distillates.

* Contribution from Bureau of Chemistry, U. S. Department of Agriculture. Demonstrated at the "Stunt Show" of the Scientific Section, A. Ph. A. meeting at Asheville, N. C.

¹ *Journal of Industrial and Engineering Chemistry*, 11, 465, 1919.

² *Am. Chem. Jour.*, 23, 356, 1900.

³ *Annales de chimie Anal.*, 6, 451, 1901.

⁴ *Journal of Industrial and Engineering Chemistry*, 1, 31, 1909; *Bureau of Chemistry Bulletin*, 134, p. 76.