bottle, as is the case in careful vapor-pressure work, or where the cork is subject to attack by the liquid used, the form of the apparatus illustrated in Fig. 2 can be used.

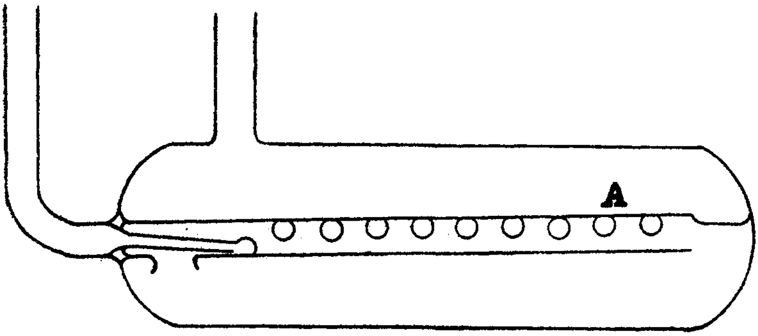

Fig. 2

The nozzle shown at B, which should have a diameter of about 2 mm., makes the bubbling more regular and the circulation more certain, thus making the latter form preferable to that illustrated in Fig 1.

F. R. v. Bichowsky and H. Storch.

University of California,
Berkeley, Cal.

## ERRATA.

On p. 2258, October number, line 7 from bottom, for "p. 2238," read p. 2254.

On p. 2261, October number, line 25 from top, for "(p 2233)" read "(p. 2249)."

On p. 2264, October number, line 21 from top, for "(p. 2244)" read "(p. 2260)."

On p. 2286, October number, footnote 1, for "p. 2268," read "p. 2284."

On p. 2287, October number, footnote 1, for "p. 2274," read "p. 2290."

On p. 2288, October number, footnote 2, for "p. 2273," read "p. 2289."

On p. 2290, October number, footnote 1, for "p. 2270," read "p. 2286."

On p. 2304, October number, footnote 1, for "p. 2286," read "p. 2302."

## CORRECTION.

Some of the values given for atomic volumes on page 1646 (**37**, July, 1915) were taken, in the preliminary draft of the table, from Ostwald's "Lehrbuch der Allgemeinen Chemie," Vol. I, p. 854 (1891). It has been intended to substitute later more accurate values, calculated from the more recently found densities and atomic weights of the elements in question, but through an oversight this was not done in every case. The corrected values for the atomic volumes, which should take the place of the old values taken from Ostwald, are as follows: Magnesium, 14.0; silicon, 11.7; white phosphorus, 17.0; calcium, 26.2; chromium, 7.4; iron, 7.5; zinc, 9.2; arsenic, 13.1; bromine, 25.7; molybdenum, 9.4; palladium, 8.7.

Furthermore, the value for the density of arsenic should be given as 5.73, and the true density of aluminum is probably nearer to 2.7 than 2.6, although the latter was Mallet's value.

I am indebted to Professor W. D. Harkins and Dr. R. E. Hall for the discovery of some of these errors.

Fortunately, none of the changes is large enough to effect essentially the curve given on page 1649, or in any way to invalidate the conclusions of the paper in question. Indeed, almost every one of these changes rather improves the agreement of the observed values and those calculated from the equation on page 1652. THEODORE W. RICHARDS.

CAMBRIDGE, MASS., Nov. 4, 1915.

[CONTRIBUTION FROM THE DEPARTMENT OF CHEMISTRY OF THE UNIVERSITY OF MINNESOTA.]

# EQUILIBRIA IN THE SYSTEMS OF THE HIGHER ALCOHOLS, WATER AND SALTS.

BY G. B. FRANKFORTER AND STERLING TEMPLE.

Received September 16, 1915.

The dehydration of alcohols is such a common process that it has been studied by many chemists.[1] Foote and Sholes[2] have studied the general theory of the drying action of a salt on a liquid and the importance of the amount of water which can be taken up by the salt. Frankforter and Frary[3] discovered the efficiency of KF as a salting-out agent for ethyl alcohol, worked out a means of testing the strength of alcoholic liquors by means of the action of KF and investigated the equilibria of the following systems: Potassium fluoride–water–ethyl alcohol; potassium fluoride–water–normal propyl alcohol; potassium carbonate–water–methyl alcohol; potassium carbonate–water–ethyl alcohol; potassium carbonate–water–normal propyl alcohol and sodium chloride–water–normal propyl alcohol. It was thought advisable to continue the work of Frankforter and Frary with some of the other alcohols and with some other salts.

---

[1] Soubeiran, *Ann.*, 30, 356 (1839); Mendeléef, *Z. Chem.*, 1865, 260; Erlenmeyer, *Ann.*, 160, 249 (1871); Smith, *Chem. News*, 30, 235 (1874); Lescoeur, *Bull. soc. chim.*, [3] 17, 18 (1897); Yvon, *Compt. rend.*, 125, 1181 (1897); Ostermeyer, *Pharm. Zeit.*, 43, 99 (——); *Z. anal. Chem.*, 39, 46 (1900); Vitali, *Boll. chim. farm.*, 37, 257 (——); *Z. anal. Chem.*, 39, 46 (1900); *Bull. Chem. Zeit.*, 24, 814, 845 (1900); Young, *J. Chem. Soc.*, 81, 707 (1902); Evans and Fetsch, THIS JOURNAL, 26, 1158 (1904); Winkler, *Ber.*, 38, 3612 (1905); Kailan, *Monatsh.*, 28, 927 (1907); Frankforter and Frary, *J. Phys. Chem.*, 17, 402–473 (1913).

[2] THIS JOURNAL, 33, 1309 (1911).

[3] *J. Phys. Chem.*, 17, 402–473 (1913).