9.8 and 19.0%. In the general case, of course, results are expressed as moles per unit weight.

The writer is indebted to Professor James B. Conant, who suggested carrying out the above tests.

Summary

The measurement of the boiling points of saturated solutions is suggested as an aid in identifying and testing the purity of compounds to which the familiar melting point procedure is not applicable because of decomposition. Examples of the method are given.

Negative results in the tests for impurities are not necessarily conclusive. Any of the procedures is subject to essentially the same limitations as the analogous test by the melting point method.

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NOTES

A Diaphragm Valve.—In connection with some experiments in which a greaseless device for regulating gas flows was needed, the diaphragm valve described in this note was developed. It consists of an aluminum diaphragm A, about 0.3 mm. in thickness, resting on the flange of a glass cup B, which has an outlet tube C, and a capillary inlet tube D, as shown in Fig. 1. The upper end of tube D and the flange are ground flat with fine carborundum powder. Around the edge of the diaphragm and the flange of the cup is a rubber gasket, E. These parts are held together by a brass frame F. The position of the diaphragm is adjusted by a differential screw G. The lower surface of the diaphragm is roughened with very fine emery paper, so as to have better contact with the ground end of the capillary tube for the regulation of the low flows.

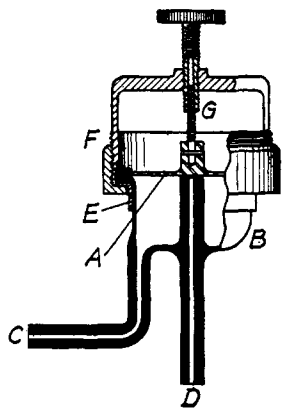

Fig. 1.

In cases where the gas used is likely to react with or corrode aluminum, a thin piece of mica is cemented with Duco Household Cement across the entire lower surface of the aluminum diaphragm. The mica surfaces should first be roughened with fine emery paper.

By varying the diameter of the inlet and outlet tubes, and the size and thickness of the diaphragm, this type of valve can be adapted to a wide range of gas flows. In connection with some experiments in this Laboratory, this type of valve was used successfully to regulate gas flows ranging from a few tenths of a cubic centimeter to several liters of gas per minute.

This valve is especially useful in controlling very slow flows where an ordinary stopcock is inadequate.

The writers wish to express their thanks to Mr. L. Testa for making the glass cup for the valve.

CONTRIBUTION FROM THE
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A Method of Winding Helical Quartz Springs and of Constructing Glass Sorption Buckets.—The construction and characteristics of the quartz helix sorption balance have been described in detail by McBain and Bakr[1] and the technique of its application to sorption studies by McBain and co-workers.[2] The author feels that the method of winding such helices which is presented here is an improvement upon that described by McBain and Bakr as regards ease of manipulation and uniformity of the springs produced.

The fibers are drawn from a quartz rod 3–5 mm. in diameter which is rotated in an oxyhydrogen flame until the quartz is evenly heated. The rod is then removed from the flame and drawn out immediately. The desirable fibers are about 0.2 mm. in diameter and about 100 cm. long. With some practice it is possible to draw fibers, a fair percentage of which will be of a useful diameter.

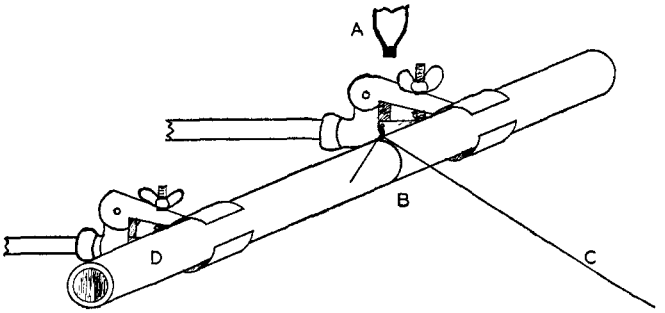

Fig. 1.

The method used in winding the helices is illustrated in Fig. 1. A section of quartz combustion tubing, D, 1.5 cm. in diameter and 30 cm. long is mounted horizontally with two buret clamps holding it loosely so that it can be moved horizontally and rotated freely. A small hand torch, A, is mounted vertically about 2 cm. above the axis of the tube. The author

[1] McBain and Bakr, THIS JOURNAL, **48**, 690 (1926).

[2] McBain and Britton, *ibid.*, **52**, 2198 (1930); McBain, Lucas and Chapman, *ibid.*, **52**, 2668 (1930); McBain, Jackman, Bakr and Smith, *J. Phys. Chem.*, **34**, 1439 (1930).