

In addition to a study and possible improvement in the conditions of flow back of the diaphragm, the further development of the method would also demand more reliable temperature measurements in the flowing gas. This could perhaps be achieved by using much finer thermocouple wire, sealed across the tube to provide the stiffness necessary to withstand the flow of gas.

In conclusion it may be remarked that the experiments which we have described are in any case of considerable interest, since they at least exhibit qualitatively a definite positive effect which can only be explained by a high rate of dissociation of nitrogen tetroxide, in contrast to the acoustic experiments which so far have led only to negative effects from which a high rate can be inferred.

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NOTES

A Simply Constructed Absolute Manometer.—This note describes a manometer developed in this Laboratory which we believe is unique if not superior to the usual types. It possesses the following features: (1) it may be constructed in almost any chemical laboratory; (2) it is easily emptied and cleaned; (3) the readings are absolute; (4) at least fair accuracy may be obtained without “boiling out” with mercury.

The construction is obvious from the drawing. If a cathetometer is not used, a scale is to be fixed between or in back of the second and third tubes which comprise the manometer proper. With the system open there will be about 29 inches between the upper and lower levels, so enough extra length is necessary to care for oscillations of the column after opening the system. The short arm at the left should be slanted considerably for reasons discussed later. Fairly large tubing is preferable to the usual barometer tubing since the error due to differences in capillarity when the walls become slightly dirty is practically eliminated. Six millimeter tubing is not too large. The tubes accessory to the manometer may be smaller to conserve mercury.

Mounting.—A board serves well to hold the tubes, which may be secured by fine wires. The greater the distance between the manometer tubes the greater the error if they are not perpendicular. This is not true, of course, if a cathetometer is used.

Filling.—The instrument is ready for use when the levels are conveniently adjusted and the space T is void of air. Use the best mercury obtainable, place the mounted instrument horizontally with the left side downward, immerse tube A in the mercury and apply a gentle, easily controlled vacuum to the other end. By proper manipulation of the instru-

ment and vacuum the mercury will rise, completely filling the tube until a point near 4 is reached. Close the stopcock, disconnect the vacuum and bring the instrument slowly to a vertical position. Excess mercury in the short arm may be poured out easily if the stopcock plug is withdrawn.

Unless such a device is "boiled out" with mercury, adsorbed air on the glass will eventually collect in space T. It may be detected by tipping the manometer backward. If air is present a minute bubble will persist after the columns should have connected. This bubble may be removed as follows. Connect both ends of the manometer to the same vacuum system. With a slight reduction of pressure draw level 1 just to the stopcock, which is then closed. Tip the instrument to the left to a horizontal position as when filling. If level 4 was originally high enough relative to the volume of T, no air will be admitted around the last bend. Set the slope of the tubes so that the bubble will just rise and escape near 4. Increasing the vacuum and tapping will aid in moving the bubble. Any air trapped in the recesses of the stopcock will not get past the first bend. Leakage at the stopcock is prevented by having the same vacuum attached at both ends. If the mercury can be kept clean this apparatus can be used with increasing accuracy. For rough work where the mercury is quickly dirtied, cleaning is much easier than in the case of the closed type since cleaning fluid and the like can be drawn or poured through without the fussy technique required by the latter.

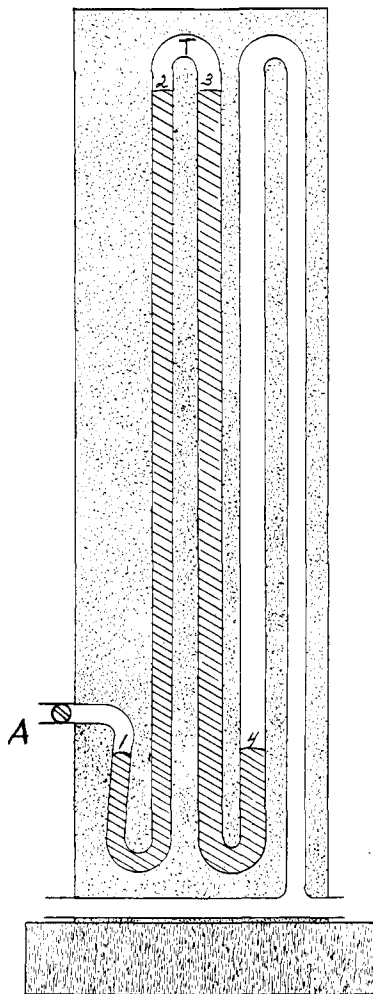


Fig. 1.

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