

region 0.75 to 1.0 μ . Sucrose and fructose exhibit a band at 0.875 μ . This band is absent from glucose. The bearing of these results on the critical increment of sucrose dihydrate and on the mechanism of the inversion of sucrose has been discussed.

3. The series of structural changes most probably involved in the inversion process have been considered in some detail.

The above work was carried out at the suggestion of Professor W. C. M. Lewis, to whom the authors wish to express their thanks. In addition, they desire to acknowledge their indebtedness to the Department of Scientific and Industrial Research of the British Government for grants, which enabled them to carry out the investigation.

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NOTES

A New Vessel for Electrometric Titration.—Among the many vessels for electrometric titrations which have been described in chemical literature, I did not find one which was suitable for class work, especially for

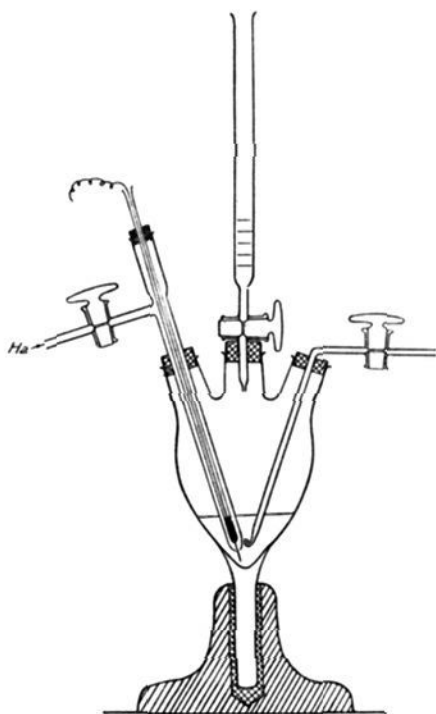


Fig. 1.

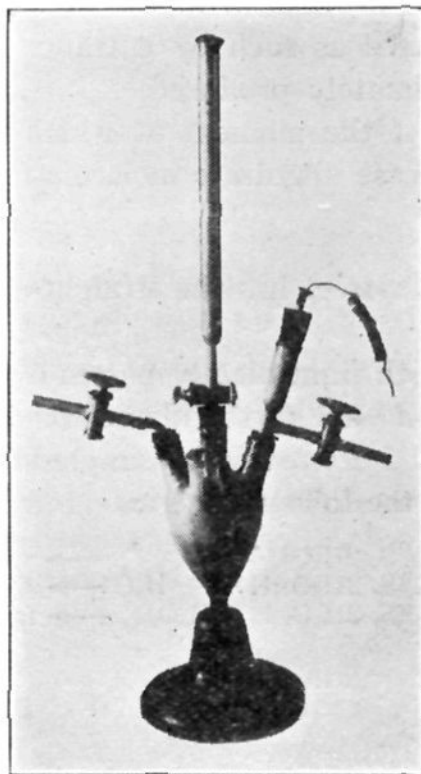


Fig. 2.

the titration of solutions the hydrogen-ion concentration of which is influenced by the partial pressure of carbon dioxide in the surrounding air. The Clark electrode with its many stopcocks is too complicated and

expensive for class work unless the class is small enough so that each student can have a large amount of individual attention.

Figs. 1 and 2 show a titration vessel which I have designed for class use. It has given satisfactory results in the class room and has displaced other forms of titration vessels in our research Laboratories.¹

The vessel (Fig. 1) which is made of Pyrex glass holds about 150 cc. of solution. It is obovoid in shape, the lower conical end terminating in a solid glass rod which serves to support the vessel in a metal base. The vessel is not permanently attached to the base and can readily be removed for washing and other purposes. From the rounded top, 4 tubulatures arise, 3 of which are in a line, with one in the center. The tubulature at each end of the row is for the calomel and hydrogen electrodes. The hydrogen electrode is of the usual bubbling type. The center tubulature is for the buret. Both the electrodes and the buret are supported by rubber stoppers. The tubulatures are set at such an angle as to bring the ends of the electrodes close together at the bottom of the titration vessel, making it possible to use a small quantity of liquid. The buret drops its liquid directly into the solution; thus none is lost by striking the electrodes or the sides of the vessel.

The fourth tubulature is convenient for introducing material such as indicators into the vessel, thus obviating the necessity of disturbing the buret or electrodes. It is closed with a rubber stopper which may be provided with a small opening to serve as a vent when the bubbling electrode is used. With all the tubulatures closed, the vessel serves very well for the "still" hydrogen electrode.

For research work I have used a larger support which will hold 9 titration vessels and their electrode equipment, Fig. 3. By using a commutating switch the variations in the hydrogen-ion concentrations of a number of solutions may be followed quite easily. The larger support is of white porcelain and enables one to observe readily the changes in color of indicators.

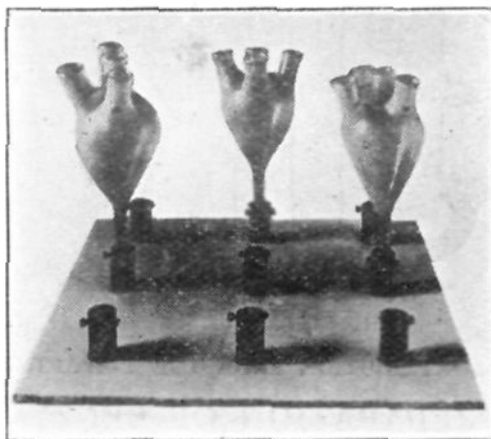


Fig. 3.

CONTRIBUTION FROM THE BIOPHYSICS LABORATORIES
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Regulator Circuit.²—A relay is ordinarily connected to a thermostat regulator in such a way that the electrical current is broken and a large part of the energy of the electro magnet is dissipated in a spark at the mercury surface of the regulator. As a consequence, rapid fouling of the mercury

¹ The Arthur H. Thomas Company, of Philadelphia, has kindly consented to list the vessel with electrodes complete in its catalogue.

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