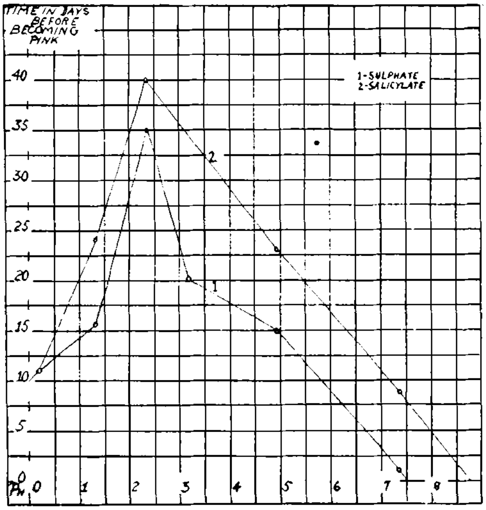
of time. Carbon dioxide in water and an atmosphere of the gas above the solution gives a colorless solution for a long period of time, in some instances for five or six months in bottles which are almost completely filled. We attribute the preserving influence of carbon dioxide to its ability to increase the hydrogen-ion concentration of the solution, to push the hydrolytic reaction through mass action and also to prevent contact with atmospheric oxygen. The effect seems to be due to the combinations of influences of carbon dioxide as an atmosphere of nitrogen above the solutions did not serve to stabilize them nearly so well as one of carbon dioxide.



Effect of changes of hydrogen-ion concentration upon the stability of eserine solutions.

CONCLUSIONS.

1. Esersine sulphate and salicylate solutions can be kept colorless for a considerable period of time by adjusting the hydrogen-ion concentration of the solvent to a p_H between 2 and 3.

2. Carbonated water with an atmosphere of carbon dioxide above seems to be the best practical method of stabilizing these solutions.

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THE EFFECT OF GELATIN ON TITRATION CURVES OF VARIOUS ACIDS.*

BY ERNEST LITTLE.[1]

Incidental to the investigation of another problem it became necessary for the writer to construct titration curves for various acids in the presence of and in the absence of gelatin. The resulting curves show surprisingly little effect of gelatin on the titration curves of the various acids. Typical examples are given in Graphs Nos. 1, 2, 3 and 4.

It would seem in light of Loeb's theory of the amphoteric nature of gelatin that the two curves ought not, in each case, to be so nearly the same. Only very minor differences are apparent. Assuming the acid to be in chemical combination with the gelatin, ought we to expect the curves for the titration of the gelatin salt to sodium gelatinate to correspond so completely to that of the acid in each case?

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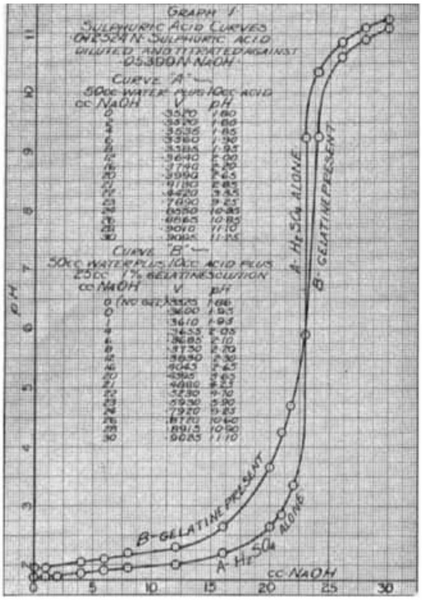
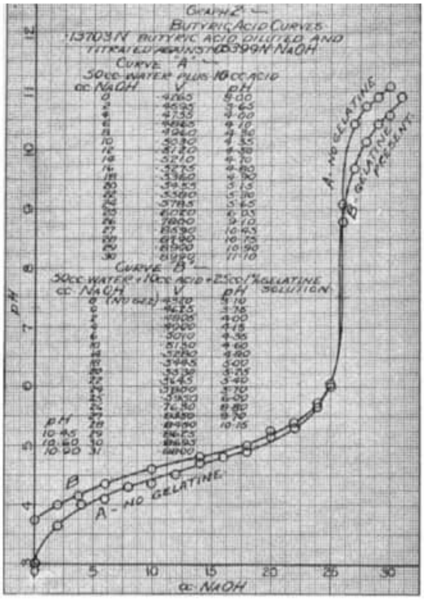
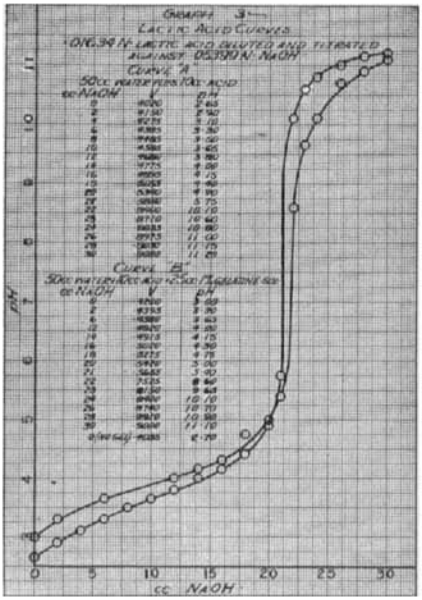
* Scientific Section, A. PH. A., Philadelphia meeting, 1926.

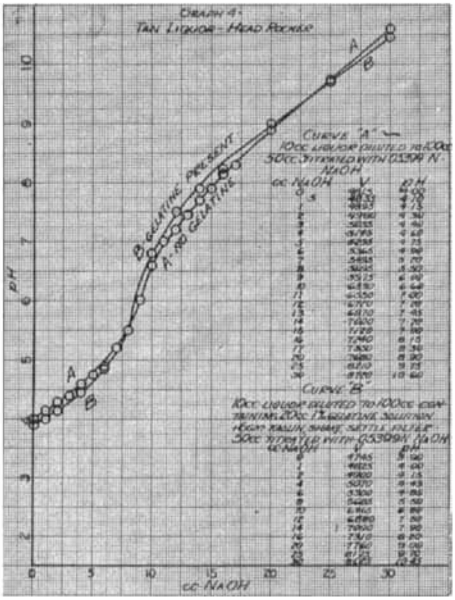
[1] Dean, New Jersey College of Pharmacy, Newark, N. J.

In order to observe results from a somewhat parallel case the titration curve for O amino benzoic acid was constructed and in Graph No. 5 along with Loeb's isoelectric gelatin curve. As would be expected the curves are quite similar due to the fact that both substances have basic and acidic groups in the molecule.

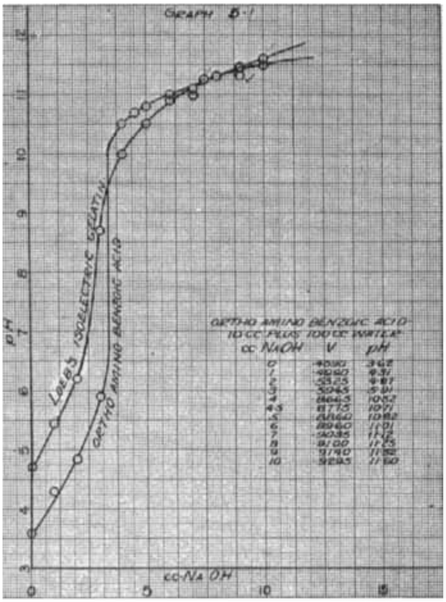


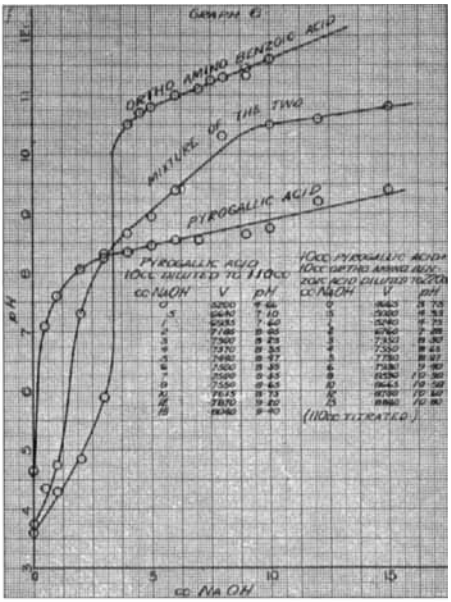


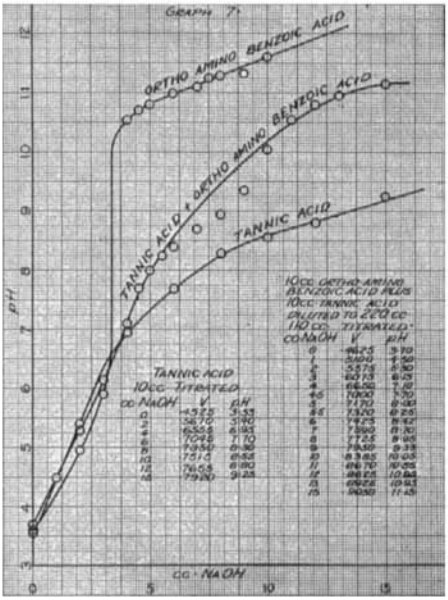


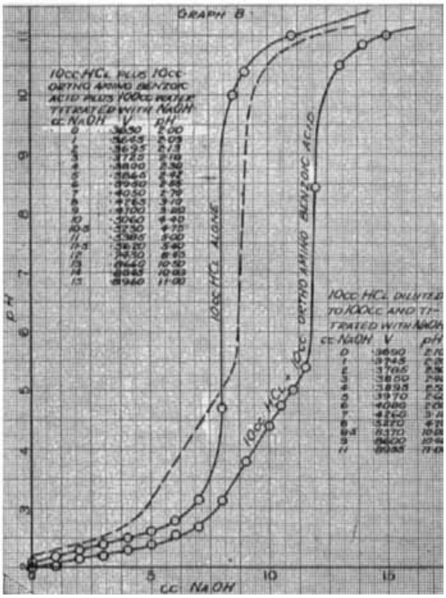


Graph No. 6 shows the titration curves for O amino benzoic acid and for pyrogallic acid. In each case 10 cc. of solution were diluted to 100 cc. and titrated with approximately $N/10$ NaOH. The titration curve for a mixture of the two is also shown. Here 10 cc. of each acid were mixed, diluted to 220 cc. and 110 cc. of the solution titrated electrometrically. As contrasted with gelatin, the









O amino benzoic acid seems to have a very definite effect on the titration curve of pyrogallic acid and the titration curve for the mixture falls very definitely in between the other two.

In Graph No. 7 the titration curve for tannic acid, O amino benzoic acid and a mixture of equal parts of the two are shown. For the tannic acid curve and the O amino benzoic acid curve, 10 cc. of a solution of each were diluted separately to 110 cc. and titrated electrometrically with approximately $N/10$ sodium hydroxide. The tannic and O amino benzoic acid curve was constructed by mixing 10 cc. of each acid solution diluting to 220 cc. and titrating 110 cc. of the resulting mixture. Here again the O amino benzoic acid shows a very decided effect on the titration curve of tannic acid which effect appears to be roughly additive. In the case of both tannic and pyrogallic acid difficulty was experienced in making readings for high p_H values. The highest p_H value obtained for each addition of sodium hydroxide was used rather than the lower ones obtained when equilibrium was established.

In Graph No. 8 we have shown the titration curves for 10 cc. of approximately $N/10$ hydrochloric acid diluted to 110 cc. and for 10 cc. of hydrochloric acid plus 10 cc. of O amino benzoic acid diluted to 120 cc. Some effect of the amino benzoic acid on the titration curve of hydrochloric acid is here seen, but its influence is much less than in the case of the weaker acids. If the titration curve for the mixture is shoved to the left to the position occupied by the broken lines, the influence is more easily seen. The similarity between these two curves and those shown in Graph No. 1 is very evident. O amino benzoic acid apparently has very little effect on the titration curve of strong acids but a considerable effect on weakly acid substances. Gelatin, however, has no considerable effect on either.

The above curves are presented for the interest and value of them as such and due to the apparent lack of conformity to Loeb's theory as to the chemical amphoteric nature of gelatin, which of course now seems definitely established. It may be pointed out that the equivalent weight of gelatin is so high that the amounts used were not large enough to permit any appreciable effect on the titration curves of the acids worked with. Loeb, however, in constructing his titration curve for isoelectric gelatin worked with an 0.8% solution of gelatin. 0.8 of a Gm. of isoelectric gelatin was present in the 100 cc. of solution used for the titration.

A MODIFIED CALVERT TEST FOR DIETHYLPHTHALATE.

BY R. D. SCOTT AND E. G. WILL.*

The writers have employed over a period of about two years a modified form of the Calvert test for diethylphthalate[1] in the examination of a large number of alcoholic beverages and medicinal preparations. The original Calvert test is briefly: To 3 or 5 cc. of the sample, in a test-tube, add 5 to 10 drops of phenol, 10 drops of concentrated sulphuric acid and heat slowly over a small Bunsen flame until most of the alcohol has been driven off and the sample assumes a red color. Cool, add 15–25 cc. of water, then add an excess of sodium or potassium hydroxide. A red color denotes the presence of diethylphthalate.

Numerous series of tests were carried out to study the effect of temperature

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* State Department of Health, Columbus, Ohio.

[1] *American Journal of Pharmacy*, 94, 11, 702 (1922).