

## A SIMPLE TEST FOR DIFFERENTIATING BETWEEN MILD AND STRONG SILVER PROTEIN.

BY HARRY S. KEELAN.

The U. S. P. X test for differentiating between strong and mild silver protein subjects the fermentation of sugar, by means of yeast, to the action of solutions of the silver proteins, of definite concentrations. Under these conditions, the strong types allow little or no carbon dioxide to form, while the mild types permit abundant gas formation. It has been deemed desirable, however, to find a simpler test, which might be carried out in a drug store. Several tests have been suggested, among them an electrometric silver-ion concentration determination. While this clearly showed that the strong type was high in silver ions, and the mild type was low, it was considered too complicated.

Since the silver-ion concentration differentiates the types, the problem resolves itself into the search for a method of getting the solutions into such a shape that these ions can be recognized by qualitative tests. The colloid must be coagulated. The usual coagulating agents, heat and acids, cannot be applied here, for the former would cause the reduction of the existing silver ions to metallic silver, and the latter would produce silver ions from metallic silver. Therefore, the protein must be coagulated, thus causing the coagulation of the silver. This must be done by some agent which will have no effect upon the existing ions or the metallic silver. There are two methods of coagulating protein—dehydration and the formation of insoluble compounds. Anhydrous magnesium sulphate does both, and therefore suggested itself as the ideal coagulant. A few successful experiments were made, and the following test proposed:

One Gm. of the unknown silver preparation is dissolved in 10 cc. of distilled water, and 6 Gm. of exsiccated magnesium sulphate is added. The whole is stirred for three or four minutes until coagulation takes place. The mixture is then filtered. The filtrate should be water-white. Dilute the filtrate to double its volume with distilled water, and add 2 or 3 drops of concentrated hydrochloric acid. A turbidity or precipitate shows that the preparation under test belongs to the strong silver protein type, whereas, the absence of any turbidity or precipitate shows that the product belongs to the mild type.

This method was tried on the following preparations:

Solargentum	no turbidity	hence mild type
Protargentum	heavy precipitate	hence strong type
Protargol	heavy precipitate	hence strong type
Silvol	no turbidity	hence mild type
Proganol	turbidity	hence strong type
Collargollum	no turbidity	hence mild type

Attempts were made to see if the one-gram sample could be reduced to  $\frac{1}{2}$  gram. For this purpose, Proganol was chosen because it gave only a turbidity in the above tests while the other two gave discernible precipitates. We still obtained a faint turbidity with the half-gram sample, but prefer to use one gram, in case some product properly classed as the strong type but of a silver-ion concentration even lower than proganol, should be under test.

The test is very simple and only about five minutes is required to make it. A further classification of those preparations within the strong group could be obtained by allowing, in all cases, the filter to drain completely, and then titrating a definite volume of the filtrate against a dilute standard solution of thio-cyanate. The turbidity noticed in the case of proganol as compared to the heavy precipitate obtained when protargol and protargentum are tested in this manner, shows a silver-ion concentration lower than the last two. This has been substantiated by electrometric determination made in this laboratory.

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### THE DETERMINATION OF THE AMOUNT OF OIL IN SPIRIT OF PEPPERMINT.\*

BY C. V. NETZ.

Spirit, or Essence of Peppermint, when manufactured according to the Pharmacopœia, is an alcoholic preparation containing approximately 10 per cent of Oil of Peppermint, with chlorophyll, extracted from the herb, as color. The Pharmacopœia directs the maceration of the moist herb with the mixture of alcohol and oil, filtration of the mixture to remove the herb and, finally, the completion of the volume by passing sufficient alcohol through the filter. The completed preparation is leaf green in color, due to the alcohol-soluble chlorophyll.

The therapeutically active ingredient is the Oil of Peppermint, in which the important constituent is the complex alcohol, menthol, of which the U. S. P. requires not less than 50 per cent. With the present high price of peppermint oil, the manufacturer is tempted to reduce the amount in the spirit below the official requirement in order to increase his profit or to enable him to meet cut price competition. The ethical way for the retailer to insure his dispensing the U. S. P. Spirit of Peppermint is to manufacture it himself. But because of the present method of taxing alcohol, the manufacturer can make a U. S. P. preparation and sell it for considerably less than the cost of the ingredients to the retailer, so one can hardly blame the thrifty pharmacist for purchasing his requirement of Spirit of Peppermint, instead of manufacturing it.

The analysis of Spirit of Peppermint for the percentage of oil is a simple matter, requiring only one piece of apparatus, a Cassia flask, which is not ordinarily possessed by every pharmacist. This flask is conical in shape, with a long narrow neck, which is graduated from 0 to 10 cc., and holds about 125 cc. up to the 0 graduation on the neck, the exact capacity being immaterial.

The method as given by Charles H. LaWall and LeRoy Forman, in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION about ten years ago, is as follows:

Introduce 25 cc. of the Spirit, accurately measured, into a Cassia flask which holds approximately 125 cc. to the 0 graduation in the neck. If a graduate is used to measure the Spirit, drain it well and rinse with portions of warm water, adding rinsings to the contents of the flask. Add 5 cc. of diluted hydrochloric acid to the Spirit and rinsings in the flask, and then follow with sufficient water at 80° C. to bring the upper level of the liquid to about the 8 cc.

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