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ADSORPTION OF ALKALOIDS FROM THE NATIONAL FORMULARY ELIXIRS.*

BY JOHN C. KRANTZ, JR.

In a paper read before this section at the Cleveland meeting, the writer proposed the use of silica gel as a filtering agent in several official preparations, where talc is now used. This suggestion caused adverse criticism by certain pharmacists who believed that silica gel would adsorb alkaloidal salts from preparations filtered through it and thus reduce the strength of the medicament. Judging from the classical work of Prof. J. U. Lloyd[1] on adhesion alkaloidal reactions, using a highly hydrated form of aluminum silicate, there seemed to be good ground for this criticism; not only might silica gel adsorb alkaloids, but probably talc also would be capable of producing some adsorption.

There are two National Formulary elixirs containing alkaloids in which talc is directed to be used as a filtering agent, one Elixir of Iron, Quinine and Strychnine, and another Elixir of Cinchona Alkaloids; in the first mentioned the directions do not suggest to set the preparation aside before filtering, but in the latter, the directions state to set the elixir aside for twelve hours, after mixing it with the talc, before filtering.

It is the purpose of this paper to show that neither silica gel nor talc adsorbs alkaloidal salts from either of these elixirs.

EXPERIMENTAL.

A standard Elixir of Iron, Quinine and Strychnine was prepared, and without filtration was carefully made up to volume. Quantities of 50 cc each were shaken with silica gel, granulated and powdered talc in varying quantities for different periods of time and then filtered and the quantity of alkaloids present were estimated in the following manner.

Transfer 10 cc of the elixir, accurately measured, to a separator, dilute with 10 cc of water and make the mixture decidedly alkaline to litmus with ammonium hydroxide. Extract the alkaloids with three portions of chloroform (15, 10, 10 cc) and evaporate the combined chloroformic extractions to dryness on a water-bath. Dry the residue to constant weight at 110° C. and weigh as anhydrous alkaloids. The elixir contains in 10 cc amounts of quinine hydrochloride and strychnine sulphate corresponding to 0.07287 Gm. of free anhydrous alkaloids.

The following results are the average of two or more determinations for each sample:

Filtering agent used for 50 cc.	Length of time before filtering.	Grams of alkaloids found.
Not filtered		0.0757 Gm.
One gram silica gel	24 hours	0.0773 Gm.
One gram granulated talc	24 hours	0.0757 Gm.

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Asheville meeting, 1923.

[1] *Am. Journ. Pharm.*, May 1916, p. 217.

Two grams granulated talc	24 hours	0.0757 Gm.
Three grams granulated talc	24 hours	0.0757 Gm.
One gram powdered talc	24 hours	0.0755 Gm.
One gram granulated talc	Immediately	0.0757 Gm.
One gram powdered talc	Immediately	0.07725 Gm.

A standard Elixir of Cinchona Alkaloids was prepared, which contained in 20 cc the prescribed amount of alkaloidal salts, corresponding to 0.0619 Gm. of free anhydrous alkaloids. The following method was used to determine the amount of alkaloids present after the various methods of filtration, as described above:

Transfer 20 cc of the elixir, accurately measured, to a separator, dilute with 20 cc of distilled water and make the mixture decidedly alkaline to litmus with ammonium hydroxide. Extract the alkaloids with three portions of chloroform (15, 10, 10 cc) and evaporate the combined chloroform extractions to dryness. Dry the residue to a constant weight at 110° C. and weigh as anhydrous alkaloids.

The following results are the average of two or more determinations for each sample:

Filtering agent used for 50 cc.	Length of time before using.	Grams of alkaloid found.
Not filtered		0.0654 Gm.
One gram silica gel	24 hours	0.0640 Gm.
One gram granulated talc	24 hours	0.0601 Gm.
Two grams granulated talc	24 hours	0.0623 Gm.
Three grams granulated talc	24 hours	0.0653 Gm.
One gram powdered talc	24 hours	0.0613 Gm.
One gram granulated talc	Immediately	0.0660 Gm.
One gram powdered talc	Immediately	0.0648 Gm.

CONCLUSIONS.

1. The results indicate that neither silica gel nor talc adsorb alkaloidal salts from these elixirs.

2. In carrying out these experiments it was noticed that the inclusion of any filtering agent in either formula is quite unnecessary, as these elixirs filter brilliantly clear through paper with one filtration.

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THE PREPARATION OF ISOTONIC SOLUTIONS.*

BY WILBUR L. SCOVILLE.

Items appear occasionally in pharmaceutical literature which advocate the making of collyria, as well as of hypodermic solutions, isotonic with the body fluids. Occasionally a formula appears which is stated to give an isotonic solution, but the formula applies only to the particular combination quoted and has a very limited interest to the pharmacist. And since the formula or the method proposed is empirical or of limited value, the subject receives but little attention.

There is, however, a growing demand for isotonic solutions and for the application of isotonic principles in collyria as well as in injection solutions. Just recently a letter was referred to me inquiring if the preparation of such solutions were practicable or upon what principles they could be made so.

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Asheville meeting, 1923.