AN INCOMPATIBILITY, LOW ISO-ALCOHOLIC ELIXIR AND AMINOACETIC ACID.*

BY FREDERICK GRILL.[1]

Problems of prescription incompatibilities usually parallel the therapeutic importance of a compound, that is, the more important therapeutically a substance becomes the more numerous are the incompatibilities associated with the material. Aminoacetic acid, glycine, is becoming therapeutically important and the pharmacist is being confronted with new dispensing problems concerning this chemical. For some time glycine has been dispensed as a powder with directions to the patient which have necessitated including with the prescription a suitable measuring device so that the individual may obtain the proper dosage. Now the question arises as to whether or not there might be other methods of dispensing glycine.

This problem was presented to the prescription department and immediately it was suggested that a solution of glycine be prepared. Considering the solubility of glycine given in standard references as soluble in water and comparatively insoluble in alcohol, the wide range of alcohol concentration possible in Iso-Alcoholic Elixir (N. F. VI) and the very pleasant taste of the Elixir, it was thought that this official formula of proper alcoholic strength would be a suitable vehicle for glycine. It was shown by actual trial that approximately 10% to 12% alcohol could be added to aqueous solutions of glycine without subsequent crystallization of the substance; so, using the dosage recommended the following prescription was compounded.

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Aminoacetic acid		60
Low Iso-Alcoholic Elixir		240
Aqua	*q. s.*	480

TABLE I.

	Sample Number.							
	1.	2.	3.	4.	5.	6.	7.	8.
Glycine	6.0 Gm.	6.0 Gm.	6.0 Gm.	6.0 Gm.	6.0 Gm.	6.0 Gm.	6.0 Gm.	6.0 Gm.
Low Iso-Alcoholic Elixir	24.0 cc.	....	....	....	....	....	....	....
Low Iso-Alcoholic Elixir —no spt. orange	....	24.0 cc.	....	....	....	....	....	....
Alcohol	....	....	4.8 cc.	....	....	....	....	....
Glycerin	....	....	9.6 cc.	....	....	....	....	....
Sucrose	....	....	....	16.0 Gm.	....	....	....	....
Dextrose, C.P.	....	....	....	....	16.0 cc.	....	16.0 Gm.	16.0 Gm.
Glucose, syrupy	....	....	....	....	....	16.0 cc.	....	....
Borax	....	....	....	....	....	....	6.0 Gm.	....
Glacial acetic acid	....	....	....	....	....	....	....	6.0 cc.
Distilled water	48.0 cc.	48.0 cc.	48.0 cc.	48.0 cc.	48.0 cc.	48.0 cc.	48.0 cc.	48.0 cc.

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Several liters of this solution were dispensed and after a short time, a period of a week or two, portions of the prescription were returned by patients because the solution had changed color; they had developed a distinct straw color.

It is quite obvious that from the standpoint of dispensing this color change in the glycine solutions presented a rather important problem, and for that reason it was decided to investigate possible reasons for this phenomenon.

Eight solutions of glycine were prepared after the formulas given in Table I, and observed under varying experimental conditions.

Solutions number one to six, inclusive, were stored in well-stoppered, two-ounce prescription bottles, exposed to diffused daylight at room temperature for a period of ninety days; and then examined for color, acidity or alkalinity with litmus, and tested for the presence of reducing substances with Benedict's Solution and phenylhydrazine hydrochloride. Samples number seven and eight were heated in boiling water for fifteen minutes, cooled, examined for color and tested with litmus.

The results of this work are summarized in Table II.

TABLE II.

Sample Number.	Color.	Reaction to Litmus.	Benedict's Solution.	Phenylhydrazine Hydrochloride.
1	Brown	Neutral	Reduced	Dextrosazone
2	Brown	Neutral	Reduced	Dextrosazone
3	Colorless	Neutral	No reduction	.....
4	Brown	Neutral	Reduced	.....
5	Brown	Neutral	Reduced	.....
6	Brown	Neutral	Reduced	.....
7	Brown	Alkaline	Reduced	.....
8	Colorless	Acid	Reduced	.....

Considering the composition of the solution of glycine in Iso-Alcoholic Elixir and water, the fact that the Elixir contains sucrose, and the experimental results, it is possible to explain the color changes noted by the presence of sucrose.

It is routinely observed that all reducing sugars have the property of coloring alkaline solutions, especially so if the solutions are heated, while reducing sugars like glucose usually do not change the color of acid solutions. Further, from a consideration of the work of Husa and Klotz (1) on syrup of ferrous iodide it may be assumed that levulose will color neutral or acid solutions dark.

These suggestions lead immediately to a possible explanation of the color observed in solutions of glycine, Low Iso-Alcoholic Elixir and water. Low Iso-Alcoholic Elixir contains sucrose, which in the presence of glycine and water is hydrolyzed to glucose and levulose as indicated by Benedict's Solution and phenylhydrazine hydrochloride solutions. Glucose in alkaline solution will produce color and levulose will color neutral or acid solutions; hence, compounds are present in the prescription which in acid, neutral or alkaline solution are capable of color production.

In order to overcome the incompatibility it is suggested that the prescription be compounded by one of the following methods: the addition of Compound Tincture of Cudbear or similar substance that will mask any color change that might arise or omit sugars of any kind using other sweetening agents if considered necessary.

SUMMARY.

1. A prescription containing aminoacetic acid, Low Iso-Alcoholic Elixir and water developed a light brown to brown color when exposed over a period of time to ordinary conditions of air, light and temperature.

2. The development of color is explained by the hydrolysis of sucrose to dextrose and levulose, both substances capable of producing color in the solutions studied.

3. The incompatibility may be corrected by the addition of color as a masking agent or the elimination of sugars of any kind as sweetening agents.

REFERENCE.

(1) Husa and Klotz, JOUR. A. PH. A., 23, 8, 780 (1934).

PRESCRIPTION CASE CONSTRUCTION.*

BY EMIL C. HORN.[1]

Unquestionably recognized as the most important department in the drug store, the prescription room is, in many cases, a most inefficiently planned and fixture-equipped component. Perhaps the reason for this noticeable inefficiency is in part due to the fact that at the time of original construction, space was not so vital, type of medicinals were of an entirely different nature and methods of medication were reversed. Also, well-built cabinets do not wear out, save for finish, and it seems so economically unsound to dispose of something still serviceable, that one hesitates to place the old relic into retirement in favor of more modern equipment. We observe in the majority of instances where a new compounding unit is publicized as a boon to building a lucrative prescription practice besides adding prestige to the department, the price is prohibitive to general acceptance and no great degree of storage efficiency is attained. The average fixture house seems to have been obsessed with the belief that a lot of small square drawers, suitable for corks only, which are now seldom used, was all that was necessary for a prescription case. From my experience, I must say no fixture designer knows the requirements for a prescription unit let alone possessing knowledge of requirements of individual stores. I would under no circumstances want to represent myself as a Moses coming out of the bull rushes with a solution to the problem, worthy of general aceeptance, but it seems that some advantages have been accomplished, which are worthy of mentioning. As a family's individual requirements and tastes call for special architecture in home construction, so individual requirements necessitate made-to-order prescription cases. In this paper, I am attempting to convey some original features for your consideration in planning your compounding unit. In designing this case, I had in mind definite objectives, namely, maximum efficiency, economical yet durable construction and eye appeal. I felt that more stores possessing outstanding departments, the better it would be for the profession as a whole, but in view of the

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