

second group tested only mercury is so slowly acted upon that no gas appears, and a film forms on its surface. Tin and lead give a gentle but not immediate evolution. Arsenic, antimony and bismuth show no evolution of hydrogen but the elements go into solution as shown by the hydrogen sulphide test. With silver nitrate the formation of the hydrides was indicated.

Hydrogen bromide of 3.6 p. c. strength causes a vigorous immediate evolution with sodium and potassium and with the granular forms of tin and lead. The action is not immediate with mercury, nor with iron and cobalt, the members of the eighth group. With every other group slight evolution takes place, except, as stated, in the fifth where hydrides are formed.

Hydrogen iodide of 0.5 p. c. strength causes an evolution immediately with all the metals except silver, magnesium, aluminum and iron and cobalt also the elements of Group V. No evolution whatever takes place with magnesium, aluminum and iron and cobalt. Bismuth, in this case, only evolves a gas and crystals separate during the course of the reaction.

The fate of iodine is most interesting. The pink color remains for days in the presence of the alkali metals; also in the presence of lead, cadmium and aluminum, but is discharged at once by copper and fades slowly with silver. Magnesium, however, discharges the color gradually. In other cases the color becomes greatly intensified at first, due presumably to the dissociation or oxidation of hydrogen iodide. Zinc, aluminum, arsenic, manganese and iron intensify the original color. It is instantly discharged with copper, tin and antimony.

The observations here recorded and the conclusions drawn therefrom are but preliminary, as those of a first survey must inevitably be. Each experiment should be repeated more carefully and other elements should be included within the scope of experimentation.

SOME CRITICISMS OF THE U. S. PHARMACOPOEIA.*

BY C. B. JORDAN.

In preparing this paper on criticisms of the Pharmacopoeia, I am fully aware that it is much easier to criticize than it is to execute, and that in preparing a work as stupendous as the one criticized, it is practically impossible to avoid errors. Yet, we wish our "Bible of Pharmacy and Medicine" to be as nearly perfect as possible and therefore criticisms are invited.

We are not all of one mind, and it is well that we are not. All may not agree with some of the criticisms offered, but that is to be expected, and discussion of them is very welcome. Some of these criticisms which I will offer may appear trifling, yet to a constant user of the United States Pharmacopoeia, they will appear of sufficient moment to merit discussion.

I have endeavored to classify these criticisms, and will offer them under various headings.

First, Lack of Uniformity.—Not consistent in writing the formulas of the glycerophosphates. Under solution of sodium glycerophosphate, the formula is

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written $\text{Na}_2\text{C}_3\text{H}_5(\text{OH})_2\text{PO}_4$, a rational and correct formula. Under sodium glycerophosphate it is written $\text{C}_3\text{H}_5(\text{OH})_2\text{PO}_4\text{Na}_2$, and under calcium glycerophosphate, it is written $\text{C}_3\text{H}_5(\text{OH})_2\text{PO}_4\text{Ca}$, and under calcium glycerophosphate the formula for glycerophosphoric acid is given as $\text{C}_3\text{H}_5(\text{OH})_2\text{PO}_4\text{H}_2$.

I can see no reason for writing the formula for this acid any different than the formula for phosphoric acid, and I believe that the rational formula is $\text{C}_3\text{H}_5(\text{OH})_2\text{H}_2\text{PO}_4$, and the salts of it should be written just as we would write the salts of phosphoric acid. At any rate, we should be consistent in our formulas, which is not true of the present U. S. P. I would urge that these formulas be written thus: $\text{C}_3\text{H}_5(\text{OH})_2\text{H}_2\text{PO}_4$, $\text{C}_3\text{H}_5(\text{OH})_2\text{CaPO}_4$, and $\text{C}_3\text{H}_5(\text{OH})_2\text{Na}_2\text{PO}_4$.

2. The factor in the assay of spirit of nitrous ether is .307 and the weight obtained is divided by 1/10 of original weight because the solution was diluted to 100 mils and 10 mils were taken for assay. Amyl nitrite is assayed in the same way, but we are directed to divide by the original weight, therefore the factor used is 4.8 instead of .48. Why not obtain the factor in the same way in both assays, since they are done in the same way?

3. Formulas for hypophosphorous acid and its salts are not the usual ones given. The present formula for hypophosphorous acid and dilute hypophosphorous acid is $\text{H}_2\text{P}_2\text{O}_5$. Following this idea, the formulas for the calcium, potassium and sodium salts are $\text{Ca}(\text{H}_2\text{P}_2\text{O}_5)_2$, $\text{K}_2\text{H}_2\text{P}_2\text{O}_5$, and $\text{Na}_2\text{H}_2\text{P}_2\text{O}_5$. It is customary to write the formulas of inorganic acids and their salts, with the hydrogen or its substituted metal first, even though all of the hydrogen is not replaced. To illustrate sodium arsenate is written Na_2HAsO_4 . This is logical and reasonable and the same method should be used with hypophosphorous acid, dilute hypophosphorous acid, and their salts. As they are written at present, they are confusing and lead one to think of them as organic acid and salts of organic acids. We know that hypophosphorous acid ionizes almost entirely as $\text{H}-\text{H}_2\text{P}_2\text{O}_5$, and the formulas of its salts are easily understood with this in mind. I would strongly urge that the following formulas be used: $\text{H}-\text{H}_2\text{P}_2\text{O}_5$, $\text{Ca}(\text{H}_2\text{P}_2\text{O}_5)_2$, $\text{KH}_2\text{P}_2\text{O}_5$, and $\text{NaH}_2\text{P}_2\text{O}_5$.

Second.—The compact formulas for the organic acids, and other common organic compounds should not be used. It means nothing to the chemist, the physician, or to the pharmacist. To illustrate its present use, in the monograph for acetic acid, the formula is given $\text{C}_2\text{H}_4\text{O}_2$ or CH_3COOH , and in the assay of this monograph the formula $\text{C}_2\text{H}_4\text{O}_2$ is twice given. The formula $\text{C}_2\text{H}_4\text{O}_2$ means little or nothing and I know of no organic chemist that teaches or uses such a formula. Therefore it seems to me that the formula CH_3COOH or $\text{HC}_2\text{H}_3\text{O}_2$ should always be used for acetic acid. What has been said of acetic acid is also true of many organic acids and common organic compounds.

Third, Carelessly Written Formulas.—In the monograph on chloral hydrate, the formula is given $\text{CCl}_3\text{COH} + \text{H}_2\text{O}$. This is an aldehyde, in fact the monograph gives it as "A compound of trichloraldehyde," therefore the aldehyde formula should be shown just as it is shown in the formula in the monograph on formaldehyde. The formula should be written $\text{CCl}_3\text{CHO} + \text{H}_2\text{O}$. The same is true for the formula for vanillin in the monograph on this subject. It is spoken of as methylprotocatechuic aldehyde, and the formula given is $\text{C}_6\text{H}_3\text{OHOCH}_3\text{COH}$ instead of $\text{C}_6\text{H}_3\text{OHOCH}_3\text{CHO}$.

The formulas for sodium and zinc phenolsulphonates are given thus, $\text{NaC}_6\text{H}_5\text{OSO}_3$ and $(\text{C}_6\text{H}_5\text{OSO}_3)_2\text{Zn}$, in their respective monographs. Since the formulas show the sulphonate group, it would seem logical that the phenol group be also shown. It would be better to write these formulas thus, $\text{NaC}_6\text{H}_4(\text{OH})\text{SO}_3$, or better $\text{C}_6\text{H}_4(\text{OH})\text{SO}_3\text{Na}$, and $(\text{C}_6\text{H}_4(\text{OH})\text{SO}_3)_2\text{Zn}$.

The formula for citral in the monograph on oil of lemon should show the aldehyde group as the assay of this oil depends upon reactions involving this group, thus $\text{C}_9\text{H}_{15}\text{CHO}$ or $(\text{CH}_3)_2\text{C}:\text{CH}.\text{CH}_2.\text{C}.\text{CH}_3.\text{CH}.\text{CHO}$. The formula for santalol should at least show the alcohol group, $\text{C}_{15}\text{H}_{25}\text{OH}$.

The formulas for physostigmine salicylate and for quinine salicylate should show the acid hydrogen of the salicylic acid just as it is shown in all other alkaloidal salts. I can see no reason for writing salicylic acid with a compact formula. These formulas, to be like the formulas of the other alkaloidal salts, should be, respectively, $\text{C}_{15}\text{H}_{21}\text{O}_2\text{N}_3$; $\text{HC}_7\text{H}_5\text{O}_3$ and $\text{C}_{20}\text{H}_{24}\text{O}_2\text{N}_2\text{HC}_7\text{H}_5\text{O}_3$.

Fourth, Errors in Chemical Formulas.—In the monograph on solution of chlorinated soda, this statement is made, "containing not less than 2.5 percent of available Cl ." It should be Cl_2 , as molecular weight determinations prove that chlorine does not exist in the atomic condition. Better still, the word chlorine should be used instead of the symbol; but if the symbol is used it should be correctly given. The same is true of iodine in the following monographs: iodine, compound solution of iodine, and tincture of iodine. More care should be used in writing these symbols or we will be subject to criticism from the chemists.

In the monograph on volatile oil of mustard, it is plainly stated that "it yields not less than 92 percent of allylisothiocyanate ($\text{C}_3\text{H}_5\text{SCN}$)."

The formula for the isothiocyanate should be given instead of the formula for the thiocyanate. It should be written $\text{C}_3\text{H}_5\text{NCS}$. If we are particular to state that it is the *iso* compound that is present, we should also be particular to give the formula for the *iso* compound.

Fifth.—The present tannic acid is a misnomer since it is not a definite compound. It should be official under the name Tannin or a definite formula given for it and a different description. State Boards often ask applicants for the equation representing the reaction that produces an inky mixture when a ferric salt is added to a preparation of a drug containing tannin. I believe this question to be an unwise one, but they are likely to continue to ask it as long as tannin is official under the name tannic acid.

Sixth.—The U. S. P. should not encourage the use of common names that are false. Under the monograph on "Calx Chlorinata," the common name "chloride of lime" is given. It is true that this name is often given to chlorinated lime, but it is misleading to say the least and the sooner we forget it the better. The U. S. P. does not attempt to give all common names, and it is wise that it does not. However it seems to me that it should not propagate a name that is manifestly false and misleading. The same can be said of the name "Solution of Arsenic Chloride" given under the monograph on solution of arsenous acid.

Seventh.—Predigested mathematics are distasteful to chemists and should not be carried to the extreme in the U. S. P.

In the monographs for spirit of nitrous ether and for amyl nitrite, we are instructed in the assay as follows: "The temperature correction is one-third of

one percent of the total percentage just found—additive if the temperature is below 25° C. and subtractive if it is above 25° C. The barometric correction is four-thirtieths of one percent of the total percentage just found for each millimeter—additive if it is above 760 mm. and subtractive if it is below 760 mm.”

It seems to me that this is carrying our predigestion to the extreme. It ought to suffice to say that the volume of gas should be corrected for temperature and pressure. If operators do not know how to make these corrections, they are working mechanically, and are always in danger of error, hence not safe analysts.

Eighth.—In the assay of lactic acid, we are instructed to pour about 2.5 mils into a tared and stoppered 250 mil flask, weigh accurately, and proceed with the assay. It would seem better to me that the amount be weighed in a weighing bottle and later transferred to a larger flask, just as is done in the case of phosphoric acid. The error in weighing would be less if weighed in a small weighing bottle. It can be easily transferred to a larger flask, the weighing bottle rinsed and the rinsings added. The same is true of the assay of the following acids: Hypophosphorous, dilute hypophosphorous, nitric, sulphuric, dilute sulphuric, hydrobromic, hydrochloric, dilute hydrochloric, acetic, dilute acetic and glacial acetic.

State Boards of Pharmacy often ask the meaning of the term “official,” and also ask applicants to state whether certain substances are official or non-official. Since this is true, the term official should be carefully defined and should mean the same to all persons using it. This term is defined in the U. S. P. on page LXV as synonymous with “Pharmacopoeial.” This is very confusing, because the word has a definite meaning, that is, it means authoritative, and the N. F. is as much an authoritative guide as the U. S. P.

The U. S. P. became an official standard June 30, 1906, when the Pure Food and Drugs Act became effective, but the N. F. became official at the same time. One other national law recognizes these books as official standards, namely, the National Prohibition Law. Since the N. F. receives the same recognition as the U. S. P. in all Acts that make the U. S. P. an official standard, it seems to me that it is a mistake to limit the term to the U. S. P. products.

I believe that an official substance is one that is recognized by either of our official standards and I hope that, in order to avoid confusion, the next revision committee will so interpret this term.

PROTECTING AND EDUCATING THE PUBLIC THROUGH POSTAL LAWS.*

BY LYMAN F. KEBLER.¹

The United States Post Office Department is the largest business enterprise in the world—an enterprise that should be conducted with a maximum of efficiency, and a minimum of things should go wrong. Legitimate business should be encouraged, not hampered. The right to do an honest business is a legal right.

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