

markable similarity which the plant bears in foliage and habit to the true jalap (*Ipomoea Purga*, Hayne), not to mention the resemblance of its tubercles. The funnel-shaped corolla and pendent flower-buds of the Tampico jalap-plant are quite unlike the corresponding parts of *I. Purga*, and furnish a ready means of distinguishing the two species:—

Ipomoea simulans, sp. nov. Radice tuberosa, caule volubili herbaceo glabro, foliis ovatis, acuminatis, cordatis v. sagittatis, indivisis, pedunculis unifloris solitariis, sepalis parvis.

Hab. in Andibus Mexicanis Sierra Gorda dietis, prov. Guanajuato (sive cl. Finck); in regione frigida ad ped. 8,000 propé Oaxaca (H. Galeotti, no. 1369!).

Radix napiformis v. subglobosa v. elongata, carnosa, 2—3 poll. longa, basi fibrillosa. Caules herbacei, graciles. Folia glaberrima 2—4 pollicaria, 1—2 poll. lata, lobis baseos acutis v. rotundatis v. subtruncatis, petiolo tenui, 1½—2½ pollicari. Pedunculi axillares, petiolum subaequant, penduli unilori v. in planta vegetiore novelli alabastra duo ferentes, altero semper (ut videtur) abortivo. Pedicelli incrassati, basi bracteis 2 minutis. Sepala ovata, obtusa, exteriora paullulum breviora. Corolla infundibuliformis, 1½—2 poll. longa, glabra, rosca, pallide striata. Stigmabilobum. Capsula calycem superans, conica, 2 locularis, valvis 4 coriaceis. Semina glabra.

Bisulphite of Lime: its Manufacture and Uses.*

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This salt of lime has, within the past few years, come into extensive use for various purposes in the arts, and is often called and written, though improperly, as its chemical formula will show, "bisulphate of lime." Very few chemical text books make any mention of this substance, or the mode of preparing it, and, although several hundred tons are now annually employed in this country, yet we know of only one or two practical chemists who manufacture it in any considerable quantities. When sulphurous acid gas is passed into a mixture of lime and warm water, a combination is formed resulting in the sulphite of lime ($\text{CaO}, \text{SO}_2 = 66$, with the usual addition of two equivalents of water), which is a white powder of slightly sulphurous taste, and soluble in about 800 times its weight of water at 60°. In an excess of sulphurous acid, it is readily soluble, forming the bisulphite of lime ($\text{CaO}, 2 \text{SO}_2 = 92$), which crystallizes in regular hexagonal prisms, difficult of solution, though more soluble in water than the sulphite, efflorescent, and by continual exposure to the air, absorbing oxygen and passing into the sulphate. In the employment of the sulphites, or bisulphites, it is therefore necessary that these salts should be kept fresh, and kept as much as possible from contact with the oxygen of the atmosphere. As sulphurous acid, upon which the properties of these compounds depend in their principal uses, is a

very powerful deodorizing agent, the bisulphite is considered much more valuable than the sulphite for arresting the acetous fermentation of various substances. It is therefore employed in some very important practical applications. In pharmacy it is used for preventing rancidity in hair oils, lard, pomades, &c. One dram of the saturated solution added to a pound of any of the named articles will preserve them for many months from changes incident to exposure to the atmosphere. For hospital purposes it is now much employed for preserving beef tea, animal and vegetable jellies, &c., all of which are exceedingly apt to turn sour when exposed to the taints of a sick room or hospital. Infected clothing, when saturated with a solution of the salt and hung up in the air, becomes disinfected in a short time, leaving no disagreeable odor, as is the case when carbolic acids and many of the chlorides are employed. In the dissecting room, and in preserving specimens of anatomy and natural history, it is now extensively used in this and other countries, either with or without the addition of carbolic acid.

Within the past few years it has been sold and used to a very considerable extent for preventing the acetous fermentation of cider, wine, and malt liquors; and certain parties have endeavored to control the exclusive sale of it for this purpose, by means of a patent, but as we are informed, without success, as its use involves no new principle, and it had been applied to such uses some time before any claim had been made for its discovery or special application.

It affords a very convenient method for testing any liquid, such as washes for the hair, various cosmetics, &c., for the presence of lead, as the presence of any salt of the latter when added to the former, may be at once detected by the black color produced, which is the characteristic of the sulphuret of lead. One who is not a professional chemist, or has not the apparatus at hand for producing sulphuretted hydrogen, may use this without any other vessel or materials than those found in any household.

By beer and ale brewers a solution of the bisulphite of lime is now employed for rinsing out and cleansing beer or ale barrels which have been used and have become musty or sour. It was formerly the practice to burn a quantity of sulphur in the barrels, or to convey the fumes of burning sulphur within the barrel; but the use of this solution is attended with much less trouble and expense.

But its most extensive use has, for the last few years, been in the manufacture of sugar, as an antiferment, for the purpose of arresting and preventing the acetous fermentation of saccharine juices or solutions from which sugar is made. We think it was first used in the manufacture of beet sugar, but it is now used very extensively in the Southern States and West India Islands, where sugar is made from the juice of the cane. The largest manufactory in this country, if not in the world, is in Louisiana, supplying all the sugar refineries and manufactories of the South and West Indies, besides filling large orders from other countries. We have recently learned that certain parties are desirous of contracting for 4,000 tons for exportation; to be delivered within one year from date of contract.

We have not visited any laboratory where it is prepared on a large scale, but no doubt Calvert's method is usually employed, as

being the best and most economical. A sulphur oven is constructed very similar to that used in the preparation of sulphuric acid. In this the sulphur is burned, producing sulphurous acid gas, which is conducted through an earthenware tube to a tall column constructed of wood or baked clay, and filled with hydrate of lime. The sulphurous acid is given off from the burning sulphur, mixed with atmospheric air and nitrogen gas, the latter of which results from the abstraction of the oxygen from the air to support the combustion of the sulphur, leaving the nitrogen as a residue. Of these combined gases, the lime absorbs only the sulphurous acid, and the others pass out into the atmosphere. The first product is the sulphite, but by continuing the process, another equivalent of acid is absorbed forming the bisulphite.

Free sulphurous acid is easily detected, even in small quantities, by its suffocating odor, like that experienced in burning lucifer matches. It gives no reaction with any of the salts of baryta, unless it is combined with a base. The reason of this is that the sulphate of baryta is insoluble, while the sulphite is soluble in free acid. Sulphuric acid in contact with any one of the salts of baryta combines with the base, and sets the other acid free, which cannot in turn exert any action on the sulphate. But, on the other hand, when sulphurous acid is added to a salt of baryta, the acid which combined to form this salt is set free, in which the sulphite of baryta is soluble. But in adding a sulphite to a salt of baryta no such solution occurs, as no acid is set free by which to dissolve the salt.

After bisulphite of lime has been exposed for some time to the atmosphere it is oxidized and a portion of it becomes sulphite of lime. The presence of sulphate may easily be determined by adding solution of the chloride of barium, which will produce a precipitate of sulphate of baryta, or the sulphite combined with the sulphate if the lime salt had been partially converted into its sulphate by oxidation. Then, by adding hydrochloric acid, the sulphite is entirely dissolved, while the sulphate remains a persistent precipitate. Of course the percentage of each may be determined by weight.

To test wines, malt liquors, &c., for the presence of any sulphite or bisulphite, it is first to be acidulated with hydrochloric acid to a degree sufficient to act upon the metals in producing hydrogen gas. If then a few small pieces of metallic zinc be added, the gas produced will be sulphuretted hydrogen, which may be detected by the peculiar odor, like that of putrid eggs, or by exposing to it a piece of paper which has been dipped in a solution of acetate, or any of the soluble salts of lead. If the gas be sulphuretted hydrogen the paper will become blackened, but if pure hydrogen, no effect will be produced. If the substance to be tested be a solid, it must first be dissolved in hydrochloric acid, and then proceeded with as in the first instance. The bisulphite of lime is now in general use for beet sugar, and does not injure the quality of the root as food for cattle.

Although the salt is extensively used for cane sugar, it has been found in some instances to diminish the quantity of good, well-grained sugar. In such cases, however, the bisulphite was probably injudiciously used by those who were not thoroughly informed of its properties.

* From the Journal of Applied Chemistry.