Original Papers.

NOTE ON THE PREPARATION OF SULPHATE OF MANGANESE.

BY HENRY CROFT,
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The new process by F. Mahla for preparing pure manganous sulphate, does not seem to be preferable to the old methods, either as regards economy, practicability, or efficiency. In preparing considerable quantities, the washing out of some pounds of the bulky manganous carbonate would be a tedious operation, and the salt would oxidize.

The same result may be obtained by the old plan, viz.:—heating black oxide (or the residue from the preparation of oxygen), with either sulphuric acid or ferrous sulphate, washing out, which is effected very easily, owing to the density of the residue; precipitating a small portion of the solution with sodium bicarbonate, and boiling this edulcorated precipitate with the remaining solution. We have here only a small quantity of carbonate to edulcorate, and the resulting salt is perfectly pure, if sufficient has been used.

A very small quantity of impurity interferes with the colours of manganous sulphide and other compounds. For lecture experiments, a solution fit for showing those colours can be prepared in a few minutes by partially precipitating the commercial salt with sodium carbonate, boiling and filtering; or by boiling with sodium acetate, and filtering from the ferric oxide.

For greater security, it may be advisable to first peroxidise the solution, by nitric acid or chlorine, &c., &c., but the commercial salt seldom contains iron protoxide.

SYRUPUS FERRI IODIDI.

BY W. B. RUSTON.

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Some three months ago, an article published in the Society's JOURNAL, upon a process for preserving Syr. Ferri Iodidi, led me to make a series of experiments, on account of having myself experienced some little difficulty in making a syrup that would remain, for any lengthened period, without undergoing a change of color.

A brief recital of these may prove of interest to some of the members of the Society who have had trouble in the same quarter. Taking first the formula, as recommended by M. Jeannel, I made a syrup having a pretty good color, although not as bright as it should be: owing, partly, to inability to obtain new honey that was perfectly clear. The syrup has retained its color until the present time; but instead of remaining unchanged in composition, I find that a copious white deposit has formed, and the syrup gives a very decided reaction—much more so than when first made—the tartaric acid giving it a slight acid taste at first. I next added tartaric acid to some syrup of iodide recently made, and also to some syrup which had become discolored, having been made some eight months previous—both syrups being made after the British Pharmacopœia. In each case there was deposited a quantity of garnet colored crystals. These were examined, and found to be tartrate of iron. Upon exposing this syrup to the direct rays of the sun, the tartrate was re-dissolved, and a white, flocculent deposit formed: the syrup exhibited a strong acid reaction, as in the first experiment. Since then I have kept it in a warm place, and it has, for now two months, remained clear; if changed at all, it has become nearer colorless than when first made. Being fully occupied with the duties of business, I have been unable to find time to prove, by analys' , what this similarity of change is,—alike in all the different cases in which the tartaric acid was used,—giving the white precipitate and strong acid reaction in each case; but from experiment, I am convinced that it is produced by the addition of the tartaric acid. I should therefore regard this addition as unjustifiable, as also other suggested additions, such as citric or phosphoric acids.

Further experiments have proved to me that the syrup can be kept without undergoing any change, if attention is given to a few particulars. To arrive at this conclusion, I made a gallon of syrup after the British Pharmacopœia; divided it between three bottles, glass stopped, as cork appears to produce discoloration, on account, probably, of the tannic acid it contains. One bottle was placed in a dark, cool cellar; another stood in a moderately warm place, in the dark; and the third in a warm situation, exposed to the light. The two latter have remained without change for the last three months, while the former has gradually become quite dark in color. It would therefore appear that it is necessary to keep the syrup in a warm situation; and after carefully observing, as well as testing it, for any change, I have concluded that keeping it excluded from, or exposed to light, produces no effect upon the syrup.

As a considerable portion of the iodine appeared to be volatilized by the heat applied in accordance with the directions of the British Pharmacopœia, I last took (as suggested by Mr. A. E. Tanner of the Pharmaceutical Society, England,) the same quantity of iron wire and iodine, and added but two ounces, instead of three, of water, as ordered in the formula of the Pharmacopœia, having the wire so fine as to allow the water to cover the whole when in the flask. The reaction commenced, and progressed without any application of heat, thus avoiding any loss in iodine through volatilization, as well as having the advantage of leaving a larger quantity of the water to dissolve the sugar. The result of this has been most satisfactory, producing a fine bright syrup, which has remained without the least change. I would therefore beg to recommend the last process; and by guarding against the use of corks, and keeping the syrup in a warm, rather than a cool position, I feel satisfied it will retain its color indefinitely.

On the Technical Applications of Dialysis.

BY PROF. CHARLES A. JOY.

A few years ago, Prof. Graham, Director of the Royal Mint in London, discovered that a certain class of substances could be more readily diffused through water than others; he found, for example that salt, sugar, gum, and dried albumen, if placed in different vessels, and covered with water, will all of them be diffused through the water, but not in the same period of time. The salt spreads rapidly; the sugar requires twice the time, the gum four times, and the albumen twenty times longer. He found, as a rule, that substances which crystallize are diffused more rapidly than those which are amorphous. The first class are called crystalloid, and the second class colloid. When they are both in solution we can employ a thin membrane, or a piece of parchment paper, and, as it were, filter or strain the crystalloid through its pores, while the colloid remains behind. This operation is called dialysis, and the contrivance for effecting it, is known as the dialyser.

A sieve, a half barrel, a drum, a glass jar open at both ends, or even porous earthen cells, will serve for the apparatus. By tying a piece of bladder, or of parchment paper, over one end of any of the above pieces of apparatus, and floating it upon water, we have all that is required. If we pour into such a contrivance a solution of albumen and of common salt, and partially sink it into a larger vessel filled with fresh water, the common salt will very rapidly strain through the membrane into the outer water, and leave all of the albumen behind. Even silicic acid, which crystallizes in the form of quartz, can be separated from compounds in this way, provided it has been previously fused with soda. Graham has performed a series of experiments upon a large class of bodies, a recapitulation of which may suggest some practical applications of his simple device.

He discovered that tannic acid diffused through parchment paper two hundred times more slowly than common salt, and finds in this fact an explanation of the reason why it takes tannin so long to penetrate hides so as to convert them into leather. All processes for making leather rapidly will be found to be based upon the facility with which the substances employed pass through membranes, and the agents used are generally composed of crystalline salts. We are not aware of any practical application of Prof. Graham's discovery to the tanning of leather, but it is