

to condense in the Soxhlet tube, and the flask taken away before it syphons over again. This saves the trouble of recovering the ether afterwards. The flask is now dried at 212°F . till of constant weight. The amount of what is extracted from the ginger thus should not be less than 3.5 per cent. (3.5 grains to the above quantity). It is generally much higher, and rarely goes down to 3 per cent. The same process should now be repeated on the same quantity of ginger, substituting alcohol for ether in the Soxhlet tube, and the alcoholic extract (which takes nearly two days to come out) should be from 2—4 per cent. (2—4 grains). A convenient quantity is then burnt (100 grains), and the ash weighed. It should lie between 3 and 4 per cent. (3—4 grains), and should never exceed 4.5 per cent. It is then treated with hydrochloric acid (1 part acid and 1 water), and raised to boiling point. The insoluble portion is filtered off, the filter paper washed, dried, and burnt, and the residue weighed. This sandy, or siliceous, matter should never exceed 1.8 cent. (100 grains = 1.8 grains), and even when it is as high as this, it is probably due to extraneous matter.

BEESWAX.

The almost daily convictions obtained for this article render it of the highest importance to be on one's guard in offering it for sale. The complete analysis of beeswax is a thoroughly scientific investigation, as very complex adulterations are now practised. There are two simple tests (both of which, however, can mislead one, when the wax is skilfully adulterated), which will, at least, give some aid to the pharmacist, especially in the case of wax adulterated with paraffin and cerasin. These, it will be remembered, are the adulterations on which practically all the convictions have been obtained, although by no means the only ones in common use. These tests are the melting point and the specific gravity. The melting point is taken in the usual method, and should be from 62° — 63°C . The specific gravity is best determined by making up mixtures of spirit and water until a small pellet of the wax, evenly cut and free from air bubbles, just remains in position in the liquid without either sinking or floating. The specific gravity of the mixture of spirit and water is then taken in the specific gravity bottle as usual.

TINCTURE OF IODINE.

The chief requirement in this is the proper amount of free iodine, which should be 11 grains in the fluid ounce. Consequently, not less than 21 nor more than 22 grains of pure crystallized hyposulphite of soda should be required for decolorization of the blue color produced on adding a little starch water to the ounce of tincture.

COMPOUND TINCTURE OF CAMPHOR.

"Paregoric without opium" is best detected thus: Dilute 1 fluid dram with

proof spirit to 1 fluid ounce. add a few drops of perchloride of iron solution (10 grains in 100 minims). If opium is present a red color is produced. Some idea of the strength of the opium can be got by taking a known strength of opium and diluting till it gives the same tint with the chloride as the solution tested.

The presence of the anise oil in this tincture is shown by the turbidity on diluting with water. Of course, other essential oils will do this as well, but it is unlikely that the oil of anise will be left out and another oil put in.

The benzoic acid is found as follows: Render the tincture alkaline; shake with ether, which dissolves out the camphor and essential oil, and separate this solution. Now acidify to set free the benzoic acid; shake out this with ether, and separate as before. Dry the second ethereal solution, and the benzoic acid will be left.

IODIDE OF POTASSIUM.

The presence of iodate of potassium in the iodide is detected by dissolving the sample in water, adding a little of a solution of tartaric acid, when iodine will be set free and color starch blue, if iodate is present. Ten grains of iodide of potassium should give 14 grains of iodide of silver when the precipitate of the latter, obtained by adding silver nitrate to a solution of the potassium iodide, is dried and weighed.

LARD.

In analyzing this the specific gravity ought to be taken, but as this is a difficult operation for the chemist and druggist with limited apparatus we will omit it.

The chief adulterant is water, and this is sought for thus: Heat the sample for two or three hours on a water-bath. If an ounce is taken it should not lose more than 12 or 13 grains. Mineral substances are sometimes added to aid the incorporation of water. These will be shown by sinking when the lard is melted.

Cotton-seed stearin is detected in the lard by applying the following test: To one dram of the fat add 10 fluid drams of petroleum ether and one drop of strong sulphuric acid. Pure lard will give a straw or faint reddish color, which, after some time, clears and almost disappears altogether, while dark red drops separate. If the cotton-seed stearin is present there is at once blackening, or a dark brown color is produced, and this so remains for a long time.

CREAM OF TARTAR.

The common adulterants of this are starch and phosphate of calcium. The starch is easily detected by boiling with water and adding solution of iodine, with which starch gives a blue color. The phosphate is detected by boiling with very dilute hydrochloric acid and adding solutions of sulphate of magnesia and ammonia, when a white precipitate is given with the phosphate. Some samples have even had bicarbonate of soda added.

The effervescence on dropping in water shows this.

PRECIPITATED SULPHUR.

From the old milk of sulphur the precipitated is distinguished by a simple test. Heat a little on the end of a knife in a flame. A residue is left with the old variety, the pure precipitated volatilizes completely.

ALCOHOL IN TINCTURES.

The amount of alcohol in tinctures is important. For most, this is shown thus: Take a certain number of fluid ounces, distil off the alcohol, and make the distillate up to the original volume, take its specific gravity, and compare with a table of alcohol and water specific gravities.

If essential oils or very volatile substances are present in the tincture, a little modification must be adopted; for instance, where benzoic acid is present, alkali can be added and then distillation effected. If essential oils are present in respectable quantities, add calcium chloride in strong solution and a little sodium phosphate. The precipitate thrown down brings the oil with it. After this distil as before.

PEPPER.

The great test for this is the total amount of ash got by burning, and the amounts soluble in water and hydrochloric acid.

Black pepper should yield total ash... 4—5 p.c.
White pepper should yield total ash... 1.2 "
Black pepper should yield ash soluble in water..... 2—3 "
White pepper should yield ash soluble in water..... .5—.6 "
Black pepper should yield insoluble ash .3—.5 "
White pepper should yield insoluble ash .1—.3 "

The solvents are first water, then hydrochloric acid. The amount soluble in hydrochloric acid is got by difference between the total ash and the sum of the other two items given above.

METHYLATED SPIRIT IN TINCTURES.

Distil off the alcohol from the tincture, add to it a little bichromate of potassium and sulphuric acid, and digest for two hours in the cold. Dilute to ten times its volume. Distil off half; make slightly alkaline with sodium carbonate; boil down to half; acidify with acetic acid, and add silver nitrate solution. Heat just to boiling. Pure spirit gives a light brown color, methylated spirit gives a very dark brown color and silver mirror on the sides of the tube.

SPIRIT OF NITROUS ETHER.

The following is reprinted from the *Diary*, which will be found to contain other useful tests: Spt. eth. nit. should have a specific gravity of 0.840 to 0.845; should not effervesce, or but feebly, when shaken up with bicarbonate of soda. The presence of aldehyde is indicated by a brown coloration on heating with caustic potash. It should yield not much less than five times its volume of the gas on keeping. The spirit may be tested with accuracy by the nitrometer, or the following simple method. Prepare two solutions as follows: