

determination of the purity of iodine. About 2 grams of the iodine were placed in a flask, 40 cc. of water, and about 4 grams of shot-zinc added. The flask was then shaken and allowed to stand with stopper inserted until the fluid was colorless. When all the iodine was taken up by the zinc, the solution was filtered into a half-liter flask, the residue and zinc hydroxide washed with hot water until free from iodine and the fluid made up to 500 cc. Fifty cc. of the solution were placed in a porcelain dish and titrated with silver nitrate, with potassium chromate as an indicator, until the end point, a slight brownish color, was reached.

The following results were obtained: Stas method—mean of five determinations gave 100.02 per cent.; second method—mean of five determinations gave 99.65 per cent. A sample of unpurified iodine gave, by this method, 98.83 per cent.

The iodine dried over the calcium chloride was tested for chlorine according to Fresenius,¹ but none was found.

For comparison, a sample of unpurified iodine was tested by the same method and the presence of the chlorine was indicated.

The following summary may be deduced from the foregoing research: (1) The Stas method gave the purest iodine; (2) sulphuric acid was the best drying agent; (3) the iodine was not contaminated when dried over calcium chloride; (4) the iodine, when pure, was satisfactorily determined when converted into zinc iodide and titrated with silver nitrate, with potassium chromate as an indicator.

A COLORIMETRIC METHOD FOR THE DETERMINATION OF SMALL QUANTITIES OF POTASSIUM.

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THIS method is primarily intended for use in the analysis of soil extracts and drainage waters where the potassium is in such small quantities that it is impracticable to use a gravimetric method. It has been used in this laboratory on a number of soil extracts, and has given very satisfactory results.

¹ "Qualitative Analysis."

The method depends upon the precipitation of the potassium in the usual way with chlorplatinic acid, and the subsequent reduction of the potassium chlorplatinate with stannous chloride in the presence of free hydrochloric acid. The precipitate of potassium chlorplatinate in very dilute solution is, of course, very small, consisting of a few minute crystals. A distinct color is imparted to the solution on adding the stannous chloride solution, however, even though the original solution contained not more than one part of potassium oxide per million.

SOLUTIONS REQUIRED.

Standard Potassium Chlorplatinate.—0.518 gram of potassium chlorplatinate is dissolved in water and the solution made up to 100 cc. For use, 1 cc. of this solution is diluted to 100 cc. One cc. of the diluted solution is equivalent to 0.00001 gram potassium oxide.

Stannous Chloride.—Boil 75 grams of powdered or granulated tin with 400 cc. of concentrated hydrochloric acid in an Erlenmeyer flask until nearly all of the tin is dissolved. Keep in a tightly stoppered bottle over a small piece of tin.

Analytical Process.—The analytical process, up to the point of adding the stannous chloride, is essentially the same as that used in ordinary analysis.

To 50 cc. of the solution to be tested add 1 cc. of dilute sulphuric acid, evaporate to dryness, and ignite to whiteness. Dissolve the residue in hot water, acidified with a few drops of hydrochloric acid, and add an excess of chlorplatinic acid. The solution is then evaporated to a thick paste in a small dish and 80 per cent. alcohol added. Wash the precipitate thoroughly with 80 per cent. alcohol, then dissolve in boiling water, cool, and make up to a definite volume (100 or 200 cc.).

Transfer 50 cc. of this solution to a color-comparison cylinder and add 3 cc. of the stannous chloride solution. A yellow color is produced, the intensity of which is proportional to the amount of potassium chlorplatinate present. This color is exactly matched by introducing into other cylinders quantities of the standard potassium chlorplatinate solution and 3 cc. of the stannous chloride solution, as before. Below are given results obtained by this method:

Amount K_2O added. Parts per million.	Amount K_2O recovered. Parts per million.
1..... 1.0	0.92
2..... 1.0	0.8
3..... 1.0	1.0
4..... 1.0	1.2
5..... 2.0	1.9
6..... 2.0	2.1
7..... 2.0	2.0
8..... 2.0	2.0
9..... 3.0	3.2
10..... 3.0	3.2
11..... 3.0	2.8
12..... 3.0	2.8
13..... 4.0	4.4
14..... 4.0	4.0
15..... 4.0	4.0
16..... 4.0	4.4
17..... 5.0	5.0
18..... 5.0	5.0
19..... 5.0	4.9
20..... 10.0	11.6
21..... 10.0	11.2

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THE DELICACY OF TESTS EMPLOYED FOR THE DETECTION OF METALS.

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THE work in the following paper was undertaken for the purpose of determining the comparative delicacy of the tests employed in the ordinary methods used in qualitative analysis in detecting metals. To this end, solutions of salts were made of such strength that 1 cc. of the solution contained 5 mg. of the element under consideration or 1 part in 200. The weaker solutions were made from the standard by diluting with distilled water. When (as in the case of silver chloride) ammonia present in the water might exert a solvent influence, water free from ammonia was used. The reagents used were of the strength employed in the Wellesley College Chemical Laboratory (see table at the end), and were added drop by drop to 1 cc. of the solution under consideration.

The experiments were carried through twice, new standard solu-