NOTES

ON SOME OF THE

CHEMICAL REACTIONS OF BRUCIA.

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In the following experiments, pure crystallized brucia was dissolved in pure water, when necessary, by the aid of just sufficient acetic acid. No deduction was made for the water of crystallization in the alkaloid. A small drop of a saturated solution of the reagent was applied to a grain of the brucia solution, placed on a glass slide.

The amount of brucia operated upon will frequently be stated in the form of a fraction, it being understood to imply the fractional part of a grain of brucia, in one grain of water.

1. Potash.

1. $\frac{1}{100}$th, grain of brucia, gives, with a solution of potash, an immediate white amorphous precipitate, which very soon becomes a crystalline mass. The ppt. is readily soluble in acetic acid, and in deficiency of the reagent, but not readily soluble in large excess.

2. $\frac{1}{500}$th, gives an immediate cloudiness, which is soon crystalline, but not abundant. The ppt. is increased by rubbing the drop with a glass rod.

2. Ammonia.

1. $\frac{1}{100}$th, gives no immediate ppt., but very soon crystals begin to form, which in a few minutes are very abundant. If the solution be rubbed, granules and crystals appear immediately. The ppt. is prevented by large excess of ammonia, but when formed, it is not readily dissolved by excess.

2. $\frac{1}{500}$th, by rubbing a few minutes, granules and crystals appear.

3. Sulphocyanide of Potassium.

1. $\frac{1}{100}$th, in a few seconds crystalline tufts begin to form, which are not readily soluble in acetic acid.

2. $\frac{1}{300}$th, no indication after 15 minutes.

4. Iodide of Potassium.

1. $\frac{1}{100}$th, almost immediately rough crystals begin to form, and in a short time there is a good deposit of tabular plates.

2. $\frac{1}{300}$th, no indication after rubbing several minutes

5. Chromate of Potash.

1. $\frac{1}{100}$th, gives an immediate yellow amorphous ppt., which very soon becomes groups of aciculated crystals, insoluble in acetic acid.

2. $\frac{1}{1000}$th, by rubbing a few minutes, there is a very good crystalline ppt. If excess of the reagent is used, there will be no ppt.

3. $\frac{1}{3000}$th, after rubbing several minutes, there will be a slight amorphous cloudiness, but no crystals.

6. Bichromate of Potash.

1. $\frac{1}{100}$th, same as with chromate of potash.

2. $\frac{1}{1000}$th, by rubbing, immediate rings of crystals.

3. $\frac{1}{10000}$th, in several minutes, a distinct amorphous ppt., which after some time becomes crystalline needles.

7. Tannic Acid.

1. $\frac{1}{100}$th, an immediate copious, dirty white amorphous ppt· which is soluble in a few drops of acetic acid·

2. $\frac{1}{1000}$th, much the same as 1.

3. $\frac{1}{10000}$th, immediately obvious, in a few minutes it is very satisfactory. The ppt. is somewhat bluish.

4. $\frac{1}{20000}$th, in a few seconds, a bluish ppt. is obvious, which soon becomes quite good.

5. $\frac{1}{40000}$th, in a little time the ppt. is perceptible.

8. Carbazotic Acid.

1. $\frac{1}{100}$th, gives an immediate copious greenish yellow amorphous ppt., which after standing some time, becomes crystalline. The ppt. is not easily dissolved by large excess of acetic acid.

2. $\frac{1}{1000}$th, an immediate yellowish green amorphous ppt.

3. $\frac{1}{5000}$th, in a few seconds a green ppt., which is increased by rubbing.

4. $\frac{1}{10000}$th, after several minutes the ppt. is just perceptible.

9. Terchloride of Gold.

1. $\frac{1}{100}$th, an immediate yellow amorphous ppt., which soon becomes flesh colored.

2. $\frac{1}{1000}$th, a greenish yellow ppt, soon becomes yellow; upon the addition of a few drops of a potash solution, the ppt. dissolves and gives a clear solution, with a slight dark ppt.

3. $\frac{1}{10000}$th, much the same as 2.

4. $\frac{1}{20000}$th, the ppt. begins in less than a minute, and soon is quite satisfactory.

5. $\frac{1}{40000}$th, the ppt. is obvious, but not satisfactory after several minutes. All the above precipitates remain amorphous.

10. Bichloride of Platinum.

1. $\frac{1}{100}$th, gives a light yellow amorphous ppt., which almost immediately becomes small aciculated crystals; in this it differs from strychnia. The ppt. is insoluble in acetic acid.

2. $\frac{1}{1000}$th, an immediate crystalline ppt.

3. $\frac{1}{5000}$th, very soon crystals appear; they are increased by rubbing.

4. $\frac{1}{10000}$th, by rubbing, crystalline rings are immediately produced.

5. $\frac{1}{20000}$th, in a few minutes, prismatic crystals are seen, with the microscope they are rather abundant.

6. $\frac{1}{40000}$th, not satisfactory after several minutes.

Chloride of palladium gives the same results as the above reagent.

11. Ferricyanide of Potassium.

1. $\frac{1}{100}$th, gives an immediate light yellow amorphous ppt., which soon becomes beautiful rosettes, plates, and stella. These are the most beautiful polariscope objects that we have seen, often showing colors without either polarizer or analyzer. These crystals are very characteristic.

2. $\frac{1}{500}$th, by rubbing, very soon an abundant granular ppt.

3. $\frac{1}{1000}$th, after some time, a slight cloudiness.

Ferrocyanide of potassium gives no ppt. in a $\frac{1}{100}$th solution.

12. Bromine in Bromohydric Acid.

1. $\frac{1}{100}$th, copious brown amorphous ppt., which soon changes to yellow, and will dissolve if sufficient reagent has not been added. Soluble in excess of acetic acid and potash.

2. $\frac{1}{1000}$th, much the same as 1.

3. $\frac{1}{10000}$th, a greenish yellow amorphous ppt., which after a little time dissolves, and is not reprecipitated upon the addition of reagent.

4. $\frac{1}{20000}$th, greenish yellow, soon dissolves.

13. Iodine in Iodide of Potassium.

1. $\frac{1}{100}$th, copious orange brown amorphous ppt., insoluble in acetic acid, but dissolves in several drops of potash solution, with the production of a dirty white ppt.

2. $\frac{1}{1000}$th, much the same as 1.

3. $\frac{1}{10000}$th, brownish ppt., soluble in a drop of potash solution, without the production of a white ppt.

4. $\frac{1}{50000}$th, a greenish yellow ppt.

5. $\frac{1}{100000}$th, a very distinct, dirty yellow cloudiness. It is best observed by placing a drop of the reagent by the side of the brucia solution, and allowing the drops to flow together.

6. $\frac{1}{500000}$th, the cloudiness is still perceptible.

14. Sulphuric Acid and Nitrate of Potash.

1. $\frac{1}{100}$th, if the drop of brucia solution be evaporated to dryness in a steam bath, and the residue be touched with a small drop of concentrated sulphuric acid, it will immediately become rose red, and give a solution of much the same color; if now, a small crystal of nitrate of potash be added, the solution immediately changes to a fine orange red.

2. $\frac{1}{1000}$th, upon the application of sulphuric acid, the residue becomes a very fair rose red, but the solution is faint; the addition of the nitre gives a fine orange.

3. $\frac{1}{10000}$th, the acid gives a faint red, and the nitre, an orange, which soon becomes yellow.

4. $\frac{1}{20000}$th, the acid solution has a faint red color, which is best seen over white paper; the addition of nitre changes it to yellow. If a small crystal of nitre be moistened with sulphuric acid, and then dragged over the deposit, the crystal becomes orange, and gives a solution of the same color.

5. $\frac{1}{50000}$th, if the nitre, moistened by the acid, be placed upon the deposit, the crystal immediately becomes quite red, and when pushed over the deposit, leaves a red track.

We may thus, by the above means, apply two very characteristic tests to the same deposit.

15. Nitric Acid and Chloride of Tin.

1. $\frac{1}{100}$th grain pure brucia, if touched with a small drop of nitric acid, becomes a fine bright red, and gives a solution of the same color, which upon the application of heat is changed to yellow-red; if, after the solution has become cold, a drop or two of solution of chloride of tin be added, it immediately assumes a beautiful purple. The color is destroyed by excess of nitric acid.

2. $\frac{1}{1000}$th, the acid gives a fine red, which soon becomes yellow-red, and when heated, is changed to yellow. The tin solution gives a beautiful lilac color.

3. $\frac{1}{10000}$th, with the deposit, the acid gives a very good red, and the solution is faintly red; if after heating, the proper quantity of tin solution be added, it gives a perceptible lilac, but it is necessary that the quantities of acid and tin be well apportioned, otherwise the latter will give no indications. This is about its limit.

4. $\frac{1}{50000}$th, if the brucia solution be evaporated to dryness in a watch glass, and while warm, a very small drop of nitric acid be placed in the centre of the deposit, the margin will soon become perceptibly red; if then the deposit be dissolved in the acid, and evaporated to dryness in a steam oven, it will leave a good red ring deposit.

5. $\frac{1}{100000}$th, when treated as in 4, the acid gives but little indication, but when it is evaporated, it gives a very fair red ring.

6. $\frac{1}{500000}$th, the acid gives no indication, but when evaporated, it leaves a deposit in the form of delicate red threads, which are best seen by placing them over a white surface.

As an appendix to the *color test* in the article Strychnia, in the September No. of this Journal. If $\frac{1}{100000}$th grain of strychnia be treated with a very small quantity of concentrated sulphuric acid, and the amount of bichromate of potash be well adjusted, it will give perfectly satisfactory results; the deposit containing very many visible points, any of which would be characteristic. These results were obtained from the deposits of several different solutions of strychnia. It is but right to state, that to be successful, it requires a very nice balancing of the materials concerned.

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