

**REAGENTS & REACTIONS
KNOWN BY THE NAMES
OF THEIR AUTHORS**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649362653

Reagents & Reactions Known by the Names of Their Authors by A. Schneider

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Cover @ 2017

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A. SCHNEIDER

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REAGENTS AND REACTIONS

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BASED ON THE ORIGINAL COLLECTION BY

A. SCHNEIDER,

Revised and enlarged by

DR. JULIUS ALTSCHUL,

for the Pharmaceutische Centralhalle.



TRANSLATED FROM THE GERMAN

BY

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MILWAUKEE, WIS.

Pharm. Review Publ. Co.

1897.



Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised
and enlarged by *Dr. Julius Attschul*.

Eleven years ago *A. Schneider* published in the Pharmaceutische Centralhalle a collection of reagents and reactions known by the names of their authors. This compilation was printed in No. 35 of the year 1885 after it had been published in somewhat abbreviated form in the Pharmaceutischer Kalender for 1885, which appeared in 1884. This first attempt at an alphabetical compilation of reagents and reactions commonly and only semi-occasionally known by the names of their authors met an undeniable demand. The number of such reactions and corresponding reagents, especially for qualitative tests, is constantly growing. In the study of chemical literature the reader frequently loses the significance of a reference to such reagents or reactions because he is not familiar with the name of the author, which stands for the chemical synonym, or cannot readily find the necessary literary reference. The following list is to assist the reader in such emergencies. That the original list filled a gap in chemical literature was clearly demonstrated by the fact that the edition of that number of the Centralhalle, al-

* Translated for the Review from the original in Nos. 28 and 29 of the Pharmaceutische Centralhalle, 1896.

though larger than usual, was rapidly sold, and also by the numerous reprints. The original list also led to the preparation of new lists, of which might be mentioned the collection of *Julien Delaite*, Luettich, 1892; that of *Alberto Janssen*, Florenz, 1894; of *Dr. C. Duennenberger*, Zuerich, 1894; and of *Schneller*, Eichstaett, 1894.

In none of these collections is any reference made to the original list of Schneider. From a note in *Krauch's Prüfung der chemischen Reagentien*, III. Auflage, p. 394, in which the work of Dr. Duennenberger and of *Ferdinand Jean et G. Mercier*, *Repertoire des réactifs spéciaux, généralement désignée sous leurs noms d'auteurs*, Paris, 1896, is mentioned without a reference to the collection of Schneider, it seems apparent that the original has been forgotten. The Pharmaceutische Centralhalle has therefore seen fit to publish a revised list based on the original one of 1885, in which the more recent literature is duly considered. The growth of this literature is readily indicated by the fact that the list published in 1885 contained about 200 articles (Dr. Duennenberger's list contains 350), whereas the present list contains over 600 articles and cross references. The author does not even now claim completeness for his list, but hopes that in its new form it may prove a serviceable adjunct both in study and laboratory practice.

As far as the selection of material is concerned stress has been laid principally on qualitative reactions. Quantitative tests have been added only in so far as they serve also for qualitative determination. Most of the items belong to the technical, pharmaceutical and physiological branches of chemistry. Of bacteriological reagents only a few of the most important were added.

The author has taken special pains to call attention, by means of cross references, to relations existing between different reactions, and particularly to the numerous modifications of some of the more important reactions. An index is added to facilitate the use of the collection.

Adamkiewicz' reaction for albumen. The acetic acid solution of albuminous substances is colored violet upon the addition of concentrated sulphuric acid, and possesses a greenish fluorescence. The same reaction results if the albumen is treated with a mixture of 1 vol. of concentrated sulphuric acid and 2 vol. of glacial acetic acid. The reaction is facilitated by the application of heat, also, according to *Wurster*, by the addition of a few grains of sodium chloride.

Agostini's reaction for glycose. If to 5 drops of the urine to be examined 5 drops of $\frac{1}{2}$ p. c. gold chloride solution and 3 drops of 20 p. c. potassa solution are added, and the mixture is gently heated the presence of sugar in the urine will be indicated by the formation of a red color.

Allen's reaction for vegetable fats. Equal volumes of fat and nitric acid, sp. gr. 1.4, are shaken for $\frac{1}{2}$ minute and then set aside for 15 minutes. The presence of vegetable fats (cotton-seed oil) is indicated by the formation of a coffee-brown color.

Allen's reaction for phenol. With hydrochloric and nitric acids phenol produces a carmine-red color.

Almén's reagent for blood. A liquid containing blood, when well shaken with a mixture of equal parts of guaiac tincture and turpentine oil, becomes blue owing to the precipitation of guaiac resin. The color is permanent to heat. See also *Weber and Schoenbein*.

Almén's tannin solution serves as a precipitant for albumen. It consists of a solution of 4 grams tannin, 8 cm. of 25 p. c. acetic acid and 100 cm. of 40 to 50 p. c. alcohol. It also precipitates nuclealbumin.

Almén's reagent for glucose is prepared by digesting 2 grams of basic carbonate of bismuth with 100 cm. potassa solution, sp. gr. 1.33, and 4 g. Rochelle salt. Upon cooling the clear solution is decanted from the precipitate. 1 cm. of the reagent is boiled for several minutes with 10 cm. of urine. If glucose is present a yellowish-brown precipitate results, which becomes darker and finally black.

This reagent is also known as the *Roettger-Almén* reagent. Compare also *Nylander's* solution.

Anderson's reaction for distinguishing between chinoline- and pyridine salts. The chloroplatinates of the latter, when boiled with water, are converted into insoluble double salts with the elimination of hydrogen chloride, whereas the former remain in solution.

Arata's test for artificial dyestuffs in wine depends upon the observation that these dyestuffs are abstracted from the wine by means of wool. The fibre is then subjected to special reactions.

Arndt's determination of sugar by means of the ferment saccharometer. See *Einhorn*.

Arnold's reactions for alkaloids.

I. Some alkaloids when heated on the water-bath with syrupy phosphoric acid, obtained by dissolving metaphosphoric acid or phosphoric acid anhydride in officinal phosphoric acid (Ph. G. III), produce characteristic color reactions: aconitine—violet; nicotine—yellow; coniine—green.

II. Triturated with conc. sulphuric acid, many of the alkaloids yield characteristic color reactions upon the addition of conc. 30 to 40 p. c. alcoholic (in some instances aqueous) potassa solution.

III. *Arnold-Vital's* reaction. A small quantity of alkaloid is triturated with conc. sulphuric acid and a grain of sodium nitrite is added; then as in II. strong potassa solution. A number of alkaloids produce characteristic color reactions. Thus e. g. atropine and homatropine produce with sulphuric acid and sodium nitrate an orange-yellow color which upon the addition of the potassa becomes reddish-violet and fades to rose-red.

Arnold's reaction for narceine. Upon heating a substance containing narceine with conc. sulphuric acid and a trace of phenol a reddish color is produced.

Axenfeld's reagent for albumen is a 0.1 p. c. solution of chloride of gold. The solution to be tested is acidulated with formic acid and heated with a drop of the reagent. If albumen is present the solution becomes purplish, upon the addition of more gold chloride, blue. The latter color reaction is also produced by glucose, starch, tyrosine, leucine, etc., but the purplish color is characteristic for albumen.

Aymonier's reaction for α -naphthol. The 15 p. c. alcoholic solution of α -naphthol is colored violet upon the addition of cane sugar and mixing with 2 vol. sulphuric acid. Upon the addition of one drop of a mixture of 1 p. potassium bichromate, 10 p. water and 1 p. conc. nitric acid the same α -naphthol solution yields a black precipitate. β -naphthol does not produce either of these reactions.

Bach's reagent for hydrogen peroxide, consists of the following solutions:

- a) 0.03 potassium bichromate and 5 drops of aniline in 1 liter of water;
- b) 5 p. c. oxalic acid solution.

5 ccm. of the solution to be tested, when shaken with 5 ccm. of solution a) and 1 drop of

solution b), yields a violet-red coloration when hydrogen peroxide is present.

Barbot's reagent for fatty oils is fuming nitric acid. When mixed with this reagent different oils show different behavior with regard to coloration and solidification. Olive oil, for example, yields a white (not red or brown) mixture which solidifies after 1 to 2 hours.

Barfoed's reagent for glucose is either a solution of 14 g. crystallized copper acetate in 200 cc. water and 5 cc. acetic acid, or, according to a more recent formula, of 0.5 copper acetate in 100 cc. water and 1 cc. acetic acid. Glucose reduces this solution in the cold, more quickly upon heating. Dextrin, cane sugar and milk sugar do not reduce the solution. It is used for the distinction between glucose and lactose in urine.

Barreswil's reagent for glucose corresponds to Fehling's solution, but contains potassa in place of soda.

Basoletto's reagent. A mixture of equal parts by volume of sesame oil and a 2 p. c. solution of cane sugar in hydrochloric acid, sp. gr. 1.124, is colored red in the cold, but more rapidly upon heating. With glucose and lactose the color is produced only when the mixture is boiled with the hydrochloric acid and allowed to cool. Compare Baudouin's test.

Baudouin's test for sesame oil. The reagent consists of 0.1 g. sugar dissolved in 10 cc. hydrochloric acid, sp. gr. 1.18. One volume of this solution is shaken with 2 vol. of the oil to be tested. If sesame oil is present the oil upon separation is cherry-red.

According to *Lewin* the reaction is carried out as follows: 0.5 g. of finely pulverized sugar in a test tube is covered with 2 cc. of the oil, then 1 cc. of hydrochloric acid, sp. gr. 1.18, is poured carefully down the sides of the tube. If sesame oil is present a rose-red zone is formed within 1 to 5 minutes.

According to *Millian*, Baudouin's test is more delicate when carried out with the well dried free fatty acids, which have been obtained from the oil.

Villavecchia and *Fabris* (q. v.) replace sugar and hydrochloric acid by furfural. Compare also *Carlinfanti*, and *Gassend*.

Baumann's reagent for polyatomic alcohols and diamines is benzoylchloride added to the solution of the alcohol or amine in aqueous soda.

Insoluble benzoyl esters are precipitated. Used for the detection of glycerine, carbohydrates and various products of bacterial activity in urine.

Bayer's reaction for indol. A solution of indol yields upon the addition of dilute nitric acid and dilute solution of potassium nitrite solution a red color or precipitate.

Beale's creosote mixture for imbedding microscopic preparations. To a solution of 180 g. methyl alcohol and 11 g. creosote sufficient chalk is added to make a thick paste. While constantly stirring 1920 g. of water are gradually added, then a few fragments of camphor. After standing several weeks the mixture is filtered.

Bechi's test for cottonseed oil. Upon heating with an alcoholic-etheral silver nitrate solution cottonseed oil (eventually upon addition of colza oil) yields a reddish-brown color; olive oil and other oils remain uncolored. The Swiss Society for Analytical Chemists in 1895 suggested the following reagent: to 1 g. silver nitrate, dissolved in 5 ccm. of water, 200 ccm. alcohol, 20 ccm. ether and 1 ccm. nitric acid, sp. gr. 1.4, are added. In order to test for cottonseed oil, 10 ccm. of the fat and 3 ccm. of the reagent are mixed and the mixture heated on a boiling water-bath for 10 minutes. If cottonseed oil is present the mixture becomes brown or even black. Compare *Millian's* reaction.

Becker's reaction for pierotoxine. The alkaloid reduces Fehling's solution when gentle heat is applied.

Bhren's test for fatty oils. When treated with a mixture of equal parts of sulphuric acid, sp. gr. 1.835 to 1.84, and nitric acid, sp. gr. 1.3, different oils show different behavior. Sesame oil produces a green color.

Beissenhirtz's reaction for aniline. If to a solution of aniline in conc. sulphuric acid a grain of potassium bichromate is added, the solution first becomes red, then blue, the color gradually disappearing.

Berthelot's alcohol reaction. If a dilute solution of alcohol is shaken with a few drops of benzoyl chloride and soda solution until the odor of benzoyl chloride disappears, the peculiar odor of ethyl benzoate is formed.

Berzelius' test for albumen. Metaphosphoric acid in freshly prepared concentrated solution pre-