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REPORT OF RECENT RESEARCHES AND IMPROVEMENTS IN  
ANALYTICAL PROCESSES.

ON COCO-NUTS. L. VAN ITALLIE. (*Ned. Tydschr. v. Pharmacie*). October, 1890.—A large nut contained about 155 grammes. of milky fluid of 1.022 specific gravity (at 18° C.) The reaction was faintly acid, and no precipitate was obtained on boiling or on addition of acetic or picric acids, showing the practical absence of albumenoids, which might have been expected in a so-called milk. 100 c.c. of the fluid were evaporated to a syrupy consistence and extracted with alcohol. The precipitate was washed on the filter with alcohol, but it readily dissolved in a little water. Delicate tests showed no traces of albumen, but the liquid readily reduced Fehling's solution. The filtrate was evaporated to a very small bulk, once more treated with alcohol, and the precipitate finally dissolved in water. The solution was not precipitated by picric acid, Mayer's solution, phospho-tungstic acid, potassium-cadmium iodide, platinic chloride, auric chloride, and tannic acid. Neither lead acetate nor the basic salt gave any precipitate, and no alkaloidal or glucosidal body was extracted by agitation with ether, chloroform, or benzol. 280 grammes of the endocarp were grated and pressed out. The fluid was precipitated with lead acetate, and the filtrate treated with liquor plumbi. The

precipitate was washed, suspended in alcohol, and decomposed with hydrogen sulphide. The filtrate from the lead sulphide was nearly colourless, and gave after evaporation no precipitate with the various general reagents for alkaloids. After boiling with dilute sulphuric acid, it did not reduce Fehling's solution, showing the absence of glucosides. The filtrate was freed from lead by a current of hydrogen sulphide, and evaporated to a syrupy consistence after neutralising the liberated acid. The liquid was mixed with alcohol, filtered, the alcohol evaporated, and the residue dissolved in water. The various reagents for alkaloids failed to produce any precipitate. Fehling's solution was reduced, but after removing the suboxide of copper, and boiling with dilute sulphuric acid, no further power of reducing copper solution was noticed, showing to the author's satisfaction the complete absence of any *alkaloids* or *glucosides* in the coco-nuts. To ascertain the nature of the sugars in the nuts, the author mixed 50 grammes. of the juice with a very slight excess of ammoniacal \* liquor plumbi. The filtrate showed undoubtedly the presence of sucrose by the usual tests. The lead precipitate was after washing suspended in water and treated with carbonic anhydride. The filtrate strongly reduced the Fehling, showing the presence of dextrose. The residue, which now might have contained the lead compound of levulose, was decomposed by hydrogen sulphide; but as the filtrate, after evaporation and neutralisation, did not reduce Fehling's solution, the absence of that substance may be taken for granted.

L. DE K.

ADULTERATION OF STARCH. F. DICKMANN. (*Zeitschr. f. Angew. Chemie.*) 1 Oct., 1890.—The author, in testing a sample of starch for ash by incinerating it in a platinum crucible, found his dish completely perforated, and to contain a lump of a metal. This consisted of lead, which was present in the sample as sulphate, to the extent of 17.6 per cent. Other mineral matter could not be detected. The moisture of the sample amounted to 11.75 per cent., and under the microscope the starch seemed to be all rice. The sample was not in powder but in the usual lumps, so there could be no question of an accidental contamination. The author is at a loss to understand what might have been the object of introducing a rather expensive article, such as lead sulphate, which has not even the power of improving the colour of the article.

L. DE K.

DETECTION OF MARGARINE IN BUTTER. BOCHAIRY. (*Ph. Zeit.*, 518).—Fifteen c.c. of the filtered butter-fat are put into a graduated cylinder, dissolved in 15 c.c. of toluene and 50 c.c. of commercial absolute alcohol are added. If the temperature does not exceed 18° C., the spirit will float on the top of the solution of the butter. The liquid must now be heated up to 50° C., and then thoroughly shaken. If the sample consists chiefly of margarine, the liquid gets at once turbid; but when one has to deal with a mixture, there forms no sensible deposit until the cylinder is put into water of 40° C. temperature. If the butter is adulterated, a more or less heavy layer will separate out. For instance, with a sample containing only 10 per cent. of margarine, 11 c.c. of deposit were obtained, but, unfortunately, the amount does not increase proportionately with the amount of margarine present. However, as a qualitative test, the process certainly deserves a fair trial.

L. DE K.

\* Liquor plumbi mixed with ammonia until a permanent precipitate threatens to form.

ASSAY OF COMMERCIAL CAUSTIC SODA. G. LUNGE. (*Zeitschr. f. Angew. Chemie.* October, 1890).—As is well known, commercial caustic soda contains some soda compounds capable of saturating acids, which are consequently reckoned as sodium oxide. These compounds are sodium carbonate, silicate, or aluminate. In accurate commercial analysis the amount of sodium carbonate is generally calculated from the amount of carbonic anhydride the sample contains; but there seems to be a kind of unwritten agreement not to pay attention to the fact that some of the caustic soda found really exists as a silicate or an aluminate. This is most likely, because in practice (soap making, etc.), the presence of these compounds does not interfere with the manufacturing; and they are also generally present in but trifling quantities. The author's process of titrating with methyl-orange has been criticised by Cross and Bevan, who hold that the process is wrong because some of the alumina will also count as soda. The author points out that these chemists made a mistake in supposing two molecules of alumina to neutralise five molecules of sulphuric acid instead of six; and also that their idea about the interference of alumina is much exaggerated. The author has rarely found the amount of alumina to exceed .1 per cent., which is not astonishing, as the high temperature to which caustic soda is exposed during the fusion makes it deposit nearly all its impurities. Of course, the so-called caustic bottoms may contain sometimes as much as two per cent. of alumina, and cannot very well be titrated with the aid of methyl-orange.

L. DE K.

QUANTITATIVE ESTIMATION OF FLUORINE. H. OFFERMANN. (*Zeitschr. f. Angew. Chemie*, No. 20, 1890).—The author's process does not much differ from the one described in THE ANALYST, 1886, by Dr. S. Bein; but instead of weighing the separated silicic acid, the fluid is titrated with normal alkali, with tincture of cochineal as indicator. As 6 molecules of potassic hydrate = 1 molecule of hydrofluosilicic acid, 1 c.c. of normal alkali = .019 gramme of fluorine. The process gives good results even in presence of organic matter or volatile acids such as hydrochloric acid, and the author hopes that owing to its simplicity, the process will attract attention; but we fear that notwithstanding the excellent test analysis, few practical analysts will try it on account of the very complicated apparatus required.

L. DE K.

ESTIMATION OF FREE LIME IN THE BLACK SODA ASH. G. LUNGE. (*Zeitschr. f. Angew. Chemie*, October 1st, 1890).—This estimation is of some importance, as the presence of some free lime is indispensable to the complete extraction of the soda. The author gives his modification of Winkler's process, which, he thinks, will be found useful in the assay of black ash. Fifty grams. of the well-mixed sample are quickly powdered in a mortar, put into a 500 c.c. flask, and mixed with warm water, which must be free from carbonic acid. It is necessary to frequently shake the flask, otherwise a hard cake will form at the bottom. After two hours the liquid is made up to the mark, and after thorough shaking 5 c.c. of the turbid liquid are pipetted off, put into a beaker, and mixed with a slight excess of barium chloride. After adding a few drops of phenol-phthalein, the alkalinity (lime) is now titrated with  $\frac{n}{5}$  oxalic acid. The author found it totally unnecessary to add sugar, a plan proposed to better dissolve the lime.

L. DE K.

ASSAY OF LOGWOOD. DR. L. SCHREINER. (*Chem. Zeit.*, No. 58, 1890).—The author did not intend to publish his process, which he has for years successfully employed; but as many correspondents believe, the accurate assay of logwood is still an impossibility, he

has finally decided to make his process known. Fifty grams. of the ground wood are completely exhausted with water, the liquid diluted up to 1 litre, and a portion of it filtered through hide powder, which must be of sound and woolly quality. The filtrate is generally colourless, and even remains so after addition of ammonia. 100 c.c. of this solution, and also 100 c.c. of the original solution, are evaporated to dryness at 100° C, and the difference between the two weighings represents the amount of colouring matters, including, of course, tannin. For the assay of extract of logwood, 10 c.c. of the powdered sample are dissolved in water and diluted up to 1 litre. To see if there is any adulteration with mineral matter, the ash is taken as well. L. DE K.

**TESTING FOR ARSENIC BY FELEITMANN'S METHOD.**—Professor Johnson has recently shown the great advantage of employing aluminium instead of zinc in this test, because commercial aluminium never contains arsenic, while it is very difficult to obtain zinc that is absolutely free from this impurity. The evolution of hydrogen from aluminium and potassium hydrate also proceeds with great regularity and without the application of heat to any extent.

**DETECTION OF WOOD-PULP IN PAPER.** WURSTER, MAANDEL VERVALSCH, No. 189.—By means of the following reagents, which must be applied in the presence of an acid, either in the cold or at a gentle heat, the presence of wood-pulp in paper may be readily detected.

Reagent.	Wood-paper.	Cellulose.
Orcine.	Dark red.	No colour.
Resorcine.	Dark green.	Violet.
Pyrogallol.	Greenish blue.	"
Phenol.	Greenish yellow.	"
Phloroglucine.	Blueish violet.	No colour.

Another excellent reagent is dimethyl-paraphenylene-diamine, which colours the wood intensely fuchsia red, and enables the analyst to approximately estimate its quantity.

**POPULAR CHEMISTRY.**—The following specimen of chemistry for the million has appeared in the *Echo*, and we reproduce it for the delectation of our readers:—Sixty samples of milk, a dozen samples of flour, bread, meat extracts, potted meats, feeding cakes, etc., can be estimated with the greatest facility, as regards flesh-forming constituents, in an hour. The cost is almost *nil*. One grain of permanganate of potash in solution made acid constitutes sixty workable measures, or *subnormes*. With a slight alteration of the process, alcohol, starch, mucilage can be estimated in the same rapid manner. The cost is so insignificant that a million may be made for a guinea. The only apparatus required are a pipette and flask, and a phial and bottle may be substituted even for these. The calculation required is quite within the capacity of a Board School lad of the sixth standard. The process has lately been brought under the notice of the Agricultural Department and School Board authorities, and will speedily make an impression on vestries, as it has already done in the grain trade. Details may be found in various agricultural papers of the month notably the *North British Agriculturist* of the 22nd and 29th ult., and subsequently. The whole of the experiments may be performed by every householder, and the pipette and flask will take their place the same as scales and weights amongst household requisites. Never has the individual possessed such power over the value of his food stuffs. A kernel of wheat, a few grains of bread, a few drops of milk, such is the test of vegetable and animal albumens.