

ANALYTICAL CHEMISTRY.

On the Reversion of Phosphoric Acid. T. S. GLADDING.

The author has previously shown that the reverted phosphates of commercial superphosphates contain iron and aluminium, as well as calcium, but that the reverted phosphates of the two former metals are soluble in ammonium citrate, only at 65° C, while reverted calcium phosphates dissolves completely at 40° C. These properties are used to distinguish the different phosphates in the work now described.

Neutral ammonium citrate is found to act least upon the insoluble phosphates present.

The fact of reversion of phosphoric acid in soils by iron and alumina was established by a series of experiments, in which natural and artificial soils were treated with solutions of phosphates of known strength, and after exposure to air and drying for several days, were examined for reverted phosphates of iron and alumina. A method for analysis of superphosphates is added. (*Am. Chem. Jour.*, 6, 1.)
A. A. B.

On the Determination of Nitrogen by Combustion with Calcium Hydroxide. S. W. JOHNSON.

Pure slaked lime, dried at a moderate heat to remove excess of moisture, is now used instead of the mixture of sodium carbonate and lime heretofore used by the author. The anterior layer of pure lime should be somewhat longer than the mixture of lime and substance and should be heated to full redness before heating the mixture. The tube is allowed to cool below redness before aspiration. Reddening of acid in the bulb is rare when pure lime is used. Standard NH_3 and HCl are used, with cochineal as indicator. Determinations of nitrogen in many substances were made by the old and new methods respectively; the results agree very well. (*Rep. Conn. Ag. Exp. Station*, 1883.)
A. A. B.

Note on the Analysis of Soils. A. GUYARD.

For *easily assimilable elements* treat 100 gms. of the soil in the cold with a cooled mixture of 150 c.c. of HCl and 150 c.c. of

water. Filter ; wash first with cold, finally with boiling water, and determine the lime, magnesia, alkalies and phosphoric acid in solution. For assimilated elements, calcine, 100 grms. of soil at as low a temperature as possible, cool, treat, cold, with 300 c.c. dilute HCl, and proceed as before. The difference between the results of the first and those of the second analysis represents the assimilated elements contained in the organic matters of the soil.

A third analysis on the material extracted from the soil by boiling *aqua regia* may be of advantage as a check upon the other two. (*Bul. Soc. Chim.* XLI, 384.) E. W.

Note on the Determination of Ammoniacal Nitrogen in Soils. A. GUYARD.

The ordinary method of using 2 to 4 grms. magnesia to 100 of the soil gives not only ammonia actually existing in the soil, but also some of the ammonia due to organic nitrogen present. It is recommended to take the amounts of the reagents given below per 100 grms. of soil for separate determinations. For ammoniacal nitrogen, calcium carbonate 10 grms.; organic nitrogen readily transformable into ammonia, magnesia subcarbonate 5 grms.; nitrogen tolerably easily converted into ammonia, calcined magnesia 2 grms.; nitrogen transformable into ammonia, calcined lime 1 grm.; second portion of nitrogen transformable into ammonia, caustic potash or soda 0.5 to 1 grm.; finally organic nitrogen by combustion with soda lime. (*Bul. Soc. Chim.*, XLI, 337) E. W.

Note on the Separation and Determination of Lime, even in Presence of great Excess of Alumina, Magnesia, Ferric Oxide and Phosphoric Acid. A. GUYARD.

After addition of an excess of ammoniacal ammonium citrate, the lime can be precipitated by ammonium oxalate, free from the other substances here mentioned. If a small amount of silica is in solution, it will be partially precipitated, carrying with it some iron and ammonia. If the precipitation is effected at 70° to 80°, no magnesia will be found in the precipitate, though phosphoric acid may be present. Calcium oxalate is soluble in a mixture of acetates and acetic acid even when dilute. (*Bul. Soc. Chim.*, XLI, 339.)

E. W.

On a New Volumetric Method for the Estimation of Nitrous Acid. A. G. GREEN AND S. RIDEAL.

The method depends upon the formation of diazo-benzol by action of nitrous acid on aniline. A decinormal solution of pure aniline is used, containing rather more than twice its equivalent of acid, half of the latter being sulphuric and half hydrochloric acid. The nitrate in a solution between decinormal and centinormal strength, is added in a series of rough experiments to constant quantities of the aniline solution until a result is obtained in which iodide-starch solution yields only a faint blue coloration. From this approximative result an accurate titration is made. The standard aniline solution should be diluted with about four times its volume of water, and the whole solution in the final titration should be about decinormal. The process has been tested with pure sodium nitrate and found accurate within 0.1%. Apart from its delicacy it is applicable to cases in which the presence of oxidizable substances forbids the use of the permanganate process. (*Chem. News* XLIX., 173.) A. A. B.

Some Remarks on the Determination of Hardness in Waters. H. JACKSON.

The author finds that the difficulty experienced in determination of hardness of water by Clark's method, when salts of magnesia are abundant in the water to be tested, may be overcome by heating the water to 70° C. without the necessity of dilution, which is the common expedient in such cases. Also he finds that by the use of solution of sodium oleate instead of soap, a satisfactory result is obtained in presence of magnesia salts in excess, without either dilution or heating. (*Chem. News* XLIX., 149.) A. A. B.

Analysis and Composition of Beeswax. O. HEHNER.

3-5 grm. of wax are dissolved in 50 c.c. methyl alcohol, and the cerotic acid is titrated with an alcoholic potash solution, corresponding to 0.3 or 0.4 c.c. of normal H_2SO_4 for each c.c. After an excess of potash solution has been added, the myricin is saponified and calculated from the potash used on the basis of 1 c.c. normal alkali to 0.4 grm. of cerotic acid or to 0.676 grm. of myricin.

English wax contains, on an average, 14.40% cerotic acid and 88.9% myricin. The organic adulterations of wax are either stearic

or palmitic acids, stearin or palmitin, Japan or carnauba wax, spermaceti paraffin, &c.

Fat acids increase the neutralization co-efficient of the wax, and neutral fats lower it.

One part of stearic acid = 1.443 of cerotic acid, 1 part of a mixture of palmitin and stearin corresponds to 2.391 of myricin.

Japan wax contains palmitic acid and palmitin, spermaceti, being equal in value to the best wax, scarcely comes in question. Carnauba wax contains 6.09 % cerotic acid and 92.08 % myricin. It is used as an adulteration along with fat. Paraffin, when used alone as an adulteration can be detected by corresponding loss of neutralizing power in the sample. When other substances are present the proportion of pure wax is calculated after determination of cerotic acid as above, by multiplying the latter by 6.117 for myricin. Specific gravity of the waxes varies between .9625 and .9675. Paraffin and fats are lighter, rosin and fat acids are heavier. Paraffin .9171, rosin 1.0865, fat acids 1.002. (*Ding. Pol. J.* 251.170.) (*Analyst*, 1883, 16) A. A. B.

On a New Reaction of Ethyl Carbonate. G. ARTH.

By boiling ethyl carbonate with alcoholic potash in a vessel provided with a reversed condenser, potassium cyanate in considerable quantities was produced. Judging from his own and M. Haller's experiences, the author regards the reaction as a general one for all carbonic ethers. (*Bul. Soc. Chim.*, XLI., 334.) E. W.

Note on the Action of Air on Solutions of Tannin, and on the Examination of Tannins. A. GUYARD.

Contrary to the assertions in some of the literature of the subject, solutions of tannin do not absorb oxygen and form gallic acid. The presence of a ferment is necessary to effect the transformation; an alkaline solution of tannin absorbs oxygen rapidly. Lead acetate acidulated with acetic acid can be used to separate tannic from gallic acid. The lead tannate is completely insoluble in this reagent, while the gallate is soluble. The lead may be removed from these compounds by sulphuric acid, and the acids titrated separately with permanganate. (*Bul. Soc. Chim.*, XLI., 336.) E. W.