

## ABSTRACTS.

### GENERAL AND INORGANIC CHEMISTRY.

#### Incompleteness of Combustion in Gaseous Explosions. H. B. DIXON and H. W. SMITH.

When a mixture of hydrogen and oxygen, in the proportions in which they combine to form water, was exploded in a leaden tube 100 metres long and 9 m. m. in diameter, there remained an explosive residue. Even with a slight excess of oxygen the hydrogen was not completely burned. From investigation, it appears that although the amount of surface exposed to the gases, has some influence on the amount unburnt, the influence is not very great, and that the incompleteness of the combustion is therefore not due to the cooling action of the surface of the vessel.

The capacity of the above mentioned lead tube was 8100 c. c. and the volume of unconsumed gas varied from 100 c. c. to 250 c. c. Nearly one per cent. of the original detonating gas remained unburnt. (*Chem. News.*, 59, 65.) W. P. M.

#### Coloration of a Coal Fire by Common Salt. NORMAN LEONARD.

The blue flame produced, so different from the well-known sodium flame coloration, has been considered as perhaps due to a union of chlorine with the carbon and hydrogen of the fuel, with formation of compounds such as chloroform and tetrachloride of carbon. This supposition is pretty well borne out by the following facts :

1. The blue flame is not produced when sodium chloride is projected on to a red-hot platinum capsule.
2. The coloration is produced equally well by potassium chloride, and less readily by the chlorides of barium, calcium and ammonium.
3. The coloration is not produced by sodium carbonate, phosphate or sulphate.
4. Chloroform, carbon tetrachloride and ethylene dichloride, when thrown into a coal fire, produce blue colorations similar to that produced by sodium chloride. (*Chem. News.* 59, 15).

W. P. M.

## ANALYTICAL CHEMISTRY.

### Decomposition of Nickel and Cobalt.

The *Chemical News* publishes the following portion of a letter from Prof. Krüss :

“ I have in fact succeeded in splitting up nickel and cobalt, each into two parts, and both these metals have one component in common. In concert with my colleague, I sent a brief notice on this subject to the *Berichte*, which will appear in Berlin on Monday next, 21st inst. The matter communicated in this short memoir has been intentionally kept very scanty, and I have given as little room as possible to speculation for fear of being led to assertions which I might perhaps soon have to withdraw. Meantime, I have fully confirmed our first observations, and we have now about ten different methods by which we can resolve these bodies, hitherto regarded as elementary, each into two parts. We shall soon give a full report on our results, but in the meantime I may inform you, as a curious fact, that we have succeeded in obtaining *green* so-called nickel salts from *red* cobalt salts and the *colorless* salts of the substance which accompanies both metals, and further, in transforming some green nickel salts into red cobalt salts and other components.

“ This may perhaps sound alchemical, but it cannot be denied. As for the spectra of the three components of cobalt and nickel, we have not as yet, with the ordinary experimental arrangements, observed any characteristic lines. This is doubtless the reason why hitherto no spectral lines have been found common to pure cobalt and nickel.” (*Chem. News*, 59, 39.) M. P. M.

### Analytical Examination of Water for Technical Purposes. A. H. ALLEN.

Determination of hardness by titration with soap solution is utterly misleading. Although acting more slowly than CaO, still MgO does not possess greater hardening power; a statement contrary to Wanklyn, who claims that the hardening power of CaO is to that of MgO as 2 is to 3. If by “hardness” of water is meant its soap destroying power, then no dilution of hard waters should be made previous to addition of the soap solution, inas-

much as the water is not diluted when used ; on the other hand, if "hardness" represents the calcium and magnesium compounds present in the water, the soap test is too crude for use. For determination of "magnesian hardness" Wanklyn suggests the addition of ammonium oxalate powder, filtration and subsequent titration of the filtrate with standard soap solution. The author finds that such procedure does not answer, as the presence of the ammonium salt (other salts of the alkalies acting in a similar manner) has a most marked effect upon the result, the indicated hardness of a magnesian water to which an oxalate has been added, being found to vary with the amount of oxalate employed. The author holds that the day of Clark's soap test has gone by, and that chemists should turn to more accurate methods. Concerning the combination of basic and acid radicals the author believes that magnesium chloride should appear in the analysis to the full extent corresponding to the chlorine and magnesium present, on account of the tendency of magnesium chloride to decompose, on evaporating its solution, with formation of free HCl. Waters containing much  $MgCl_2$  corrode the boiler at the water line. The addition of  $NH_4Cl$  will prevent the decomposition referred to, and, from experience with sea water, NaCl appears to act the same way. All the calcium, over and above that required to form carbonate, should be expressed as  $CaSO_4$ , on account of the prominence that should be given to the tendency of the water to form boiler scale. (*J. Soc. Chem. Ind.*, 7, 795.) W. P. M.

### Estimation of Caustic Alkali in Presence of Alkaline Carbonates. LEONARD DOBBIN.

The method is a kind of inverted "Nessler" test. A solution is prepared of the double potassium and mercury iodide, and a known amount of ammonium chloride is added. Alkaline carbonates give no reaction with this reagent, but a caustic alkali, when added in sufficient quantity to break up all the  $NH_4Cl$  present will give the usual "Nessler" coloration. The ready solubility of the well-known brown precipitate in a solution of  $NH_2Cl$ , prevents any formation of color before the whole of the  $NH_4Cl$  has been broken up into free ammonia. With a

standard solution such as the above, and also a standard solution of caustic alkali, the process for quantitative purposes is apparent. For use as a quantitative test for caustic alkali the reagent may be quickly made by taking a small quantity of  $\text{HgCl}_2$  solution, adding solution of KI until red precipitate just redissolves and then adding a drop of  $\text{NH}_4\text{Cl}$  solution. (*J. Soc. Chem. Ind.* **7**, 829.)

W. P. M.

#### **New Test for Tannic Acid.** S. G. RAWSON.

Ammonium chloride mixed with ammonia, produces in solutions of tannic acid a white precipitate which rapidly becomes reddish brown on exposure to the air. With gallic acid no precipitate falls but the liquid becomes red. In working with dilute solutions of tannic acid it is better to add the ammonia mixture slowly, so that it may float on top. The white precipitate may then be easily seen at the line of separation of the two liquids. (*Chem. News*, **59**, 52.)

W. P. M.

#### **Estimation of Glycerine in Soaps, Leys and Concentrated Glycerine.** OTTO HEHNER.

A valuable paper not suitable for abstraction. (*J. Soc. Chem. Ind.*, **8**, 4.)

W. P. M.

#### **Testing of Lard for Cotton Seed Oil and Beef Stearine.** JOHN PARRISON.

Forty drops of the melted lard are placed in a test tube and dissolved in 10 c. c. ether. Two c. c. alcoholic solution  $\text{AgNO}_3$  (1 of the salt to 100 alcohol) are added. The tube and its contents are left to stand five or six hours away from the light. If present, cotton seed oil will reduce the silver and imparts a maroon color to the solution. By comparing the depths of color with those produced by lards containing known amounts of cotton seed oil, the quantity present in the sample is estimated.

When searching for beef stearine, prepare an ethereal solution of the lard as above, plug the tube loosely with cotton wool and allow crystals to form by spontaneous evaporation. Under the

microscope the beef stearine crystals form curved tufts somewhat of the shape of the short tail of a horse, with terminals pointed and hair-like. Lard crystals are usually found in oblong plates, occasionally radiated, and have oblique terminals. (*J. Soc. Chem. Ind.*, 8, 30.)

W. P. M.

## INDUSTRIAL CHEMISTRY.

### A New Alkali Process. W. W. STAVELEY.

Referring to the many attempts that have been made to decompose  $\text{Na}_2\text{SO}_4$ , by means of slaked lime, the author states that it occurred to him that, probably at the moment of formation of  $\text{Na HO}$ , a reverse action takes place, and that if some body were present which could combine with the  $\text{Na HO}$  at the moment of formation, better results could be obtained. Upon agitating a mixture of  $\text{Na}_2\text{SO}_4$  solution and slaked lime and gradually adding cresol thereto, an almost complete decomposition of the sulphate into sodium cresylate was obtained with a precipitation of  $\text{Ca SO}_4$ . The sodium cresylate remaining in solution may be readily decomposed by means of  $\text{CO}_2$  (fuel or limekiln gases) forming  $\text{Na}_2\text{CO}_3$  in solution and liberating the cresol, which will float on the surface as an oily liquid, and may be again employed for another lot of  $\text{Na}_2\text{SO}_4$ . The paper is a full one and gives some figures as to cost, compared with other processes. (*J. Soc. Chem. Ind.*, 7, 807.)

W. P. M.

### Natural Aperient Bitter Waters. OTTO HEHNER.

It is doubtful if it be generally known by the medical profession that these waters, coming usually from very shallow wells fluctuate in strength almost from day to day. By varying the method of collection, two samples of very different strengths may be taken at the same time, as the stronger water tend to collect at the bottom of the well. In the same brand of water, bought at different times in the London market, the author found the following amount of  $\text{Mg SO}_4$  :

1st sample.....	215.85 parts per 10000.
2d " .....	304.80 " " "

(*Analyst*, 14, 36.)

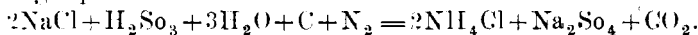
W. P. M.

**Wool and Fur ; their Origin, Structure, Chemical and Physical Composition—Composition and Modes of Cleaning them for the Textile Industry.** WATSON SMITH.

A very full, interesting and abundantly illustrated paper, containing special reference to the use of volatile liquids (such as  $\text{CS}_2$ ) for the purpose of scouring, in place of the soaps and alkalis more commonly employed. (*J. Soc. Chem. Ind.*, 8, 17.) W. P. M.

**A New Process for Obtaining Ammonium Chloride from the Nitrogen of Coal, Coke, Cinders and Organic Matter generally.** ANDREW FRENCH.

When nitrogenous organic matter is burned with a limited supply of air, in presence of sulphurous acid, steam and common salt, the author believes reaction takes place according to the following equation :



The presence of  $\text{NH}_4\text{Cl}$  about the mouths of coal mines, where fires have started, may be thus explained, the waters of collieries frequently containing notable quantities of salt. Laboratory experiments were made with coal, coal cinders, shales, sewage sludge cake, seaweed, etc., in every case  $\text{NH}_4\text{Cl}$  was obtained. The author does not consider the process as yet developed to a manufacturing stage, but believes that it will be ultimately one of the important sources of ammonia. (*J. Soc. Chem. Ind.*, 7, 735.)

W. P. M.

REGULAR MEETING, Dec. 7th, 1888.

Prof. W. P. Mason in the chair.

The minutes of the preceding meeting were read and approved.

Election of officers for the ensuing year being next in order, the chair appointed Messrs. Munsell and Kent as tellers.

The following officers were elected :

*President,*

C. F. CHANDLER.

*Vice-Presidents,*

A. A. BRENNEMAN,

A. C. HALE,

T. S. HUNT,

W. P. MASON,

C. E. MUNROE,

J. W. MALLETT.

*Corresponding Secretary,* M. ALSBERG.

*Recording Secretary,* D. WOODMAN.

*Treasurer,* J. H. STEBBINS, JR.

*Librarian,* WM. RUPP.

*Curators,*

W. H. KENT,

F. VANDERPOEL,

A. H. SABIN.

*Committee on Papers and Publications,*

A. C. HALE,

A. A. BRENNEMAN,

J. F. GEISLER.

*Committee on Nominations,*

M. LEAL,

R. W. MOORE,

A. EIMER,

A. P. HALLOCK,

T. D. O'CONNOR.

*Directors,*

M. ALSBERG,

D. WOODMAN,

J. H. STEBBINS, JR.,

WM. RUPP,

L. H. FRIEDBURG,

H. ENDEMANN,

M. E. WALDSTEIN,

C. F. CHANDLER,

T. D. O'CONNOR,

W. H. KENT.

It was moved by Dr. Friedburg, that the names of Mendelejeff, Odling and Kćkulć, be added to the list of Honorary Members of the Society. Carried.

The following papers were then read by title :

“Fatal Poisoning by Carbon Monoxide.” By Prof. W. P. MASON.

“On a New Method for Commercial Analysis of Indigo.” By F. A. OWEN. Communicated by A. H. SABIN.

“On a Modification of Gunningham’s Blast Lamp.” By A. H. SABIN.

The secretary was directed to cast one ballot for the election of ROBERT W. HALL, University Building, N. Y., and C. T. POMEROY, Ph. D., 266 Halsey street, Newark, N. J.

Mr. L. E. MUÑOZ DEL MONTÉ was proposed for membership.

The meeting was then adjourned.

T. D. O’CONNOR,

Recording Secretary.

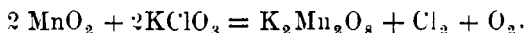


ABSTRACTS:

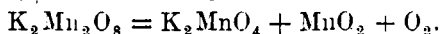
GENERAL AND INORGANIC CHEMISTRY.

Decomposition of Potassium Chlorate by Heat in Presence of  $MnO_2$ . H. McLEOD.

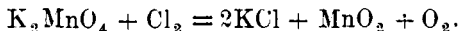
The first action is :



Afterwards by further heating :



The third stage is not so clear ; it is very improbable that the manganate is transformed into permanganate by the oxygen from the chlorate. It is more likely that it is acted on by more chlorine produced by the action of the  $MnO_2$  on fresh chlorate, thus :



If the chlorine produced by the action of the  $MnO_2$  directly on the  $KClO_3$  is thus absorbed by the manganate, it fully explains the very small quantity of chlorine that is evolved.

Chlorine is certainly evolved as soon as the action commences. The author finds that the  $MnO_2$  cannot, as has been stated, be exhausted by use ; it enters into chemical reaction and is reproduced. (*J. Chem. Soc.*, 55, 184.) W. P. M.

On a New Acid of Tin. W. SPRING.

The author has found a combination of the formula  $H_2 Sn_2 O_7$ , of the type of disulphuric acid,  $H_2 S_2 O_7$ , or dichromic acid,  $H_2 Cr_2 O_7$ .

A solution of stannous chloride  $Sn Cl_2$ , in a solution slightly acidulated with  $H Cl$  is treated with an excess of pure barium binoxide ; the tin oxide remains in a colloidal state, and is separated from the barium chloride by dialysis. The solution free of  $Ba Cl_2$  is evaporated on the water bath ; the result is a white mass the analyses of which gives

		Calculated for $H_2 Sn_2 O_7$ .
Sn	67.33	67.40
$H_2 O$	5.40	5.14
O	27.16	27.46

These determinations lead to the conclusion of the existence of the compound  $\text{Sn O}_3$ , capable of remaining in combination with water at  $100^\circ$  to form  $2\text{SnO}_3, \text{H}_2\text{O}$  or  $\text{H}_2\text{Sn}_2\text{O}_7$ . The author expects to study the mechanism of the transformations by the barium binoxide. (*Bul. Soc. Chim.*, **51**, 182.) M. L.

**Analysis of Waters of the Yellowstone National Park.**  
F. A. GOOCH AND J. E. WHITFIELD.

This excellent paper, from *Bulletin of the U. S. Geological Survey*, No. 47, is printed in full in the *Chemical News*, beginning with 59-113. A full account is given of the analytical methods employed. W. P. M.

## ORGANIC CHEMISTRY.

**Starch Iodide.** SEYFERT.

Pfeiffer and Tollens have decided that the formula of starch is  $\text{C}_{24}\text{H}_{40}\text{O}_{20}$ , and that of the iodide  $(\text{C}_{24}\text{H}_{40}\text{O}_{20})_8\text{I}_7$ , containing 22.865 per cent. I. On this basis it is proposed to determine starch by dissolving one grm. in water, cooling, adding 50 c.c. of iodine solution, 20 c.c. concentrated HCl, and diluting to 500 c.c. After vigorous shaking, the starch iodide is allowed to settle, and in an aliquot portion of the clear liquid the excess of iodine present is determined by hyposulphite. The iodine solution contains 12 or 13 gms. I per litre, with sufficient KI to effect solution. The amount of iodine absorbed by the starch, multiplied by 4.37, gives the amount of starch present. (*Dingl. Jour.*, **271**, 189.) E. W.

**On Dioxethyl Acetone.** E. GRIMAUX and L. LEFEVRE.

Theory indicates the existence of two isomeric derivatives of glycerine by loss of hydrogen, glyceric aldehyde and dioxacetone. The first has been obtained by one of the authors by the oxidation of glycerine by platinum black, and he has shown that it is a true fermentable sugar; the authors in trying to obtain dioxacetone have obtained its dioxethyl derivative.



The paper concludes with the preparation of dioxethylacetone by the use of ethoxaceto-ethoxacetic ether, and descriptions of dioxethylacetone ; the latter strongly reduces cupro-potassic solutions, etc., etc. (*Bul. Soc. Chim.*, **51**, **1**, 15.) M. L.

### Reduction of Cupric Salts by Sugars. M. MOUNET.

A solution of saccharose, saturated at ordinary temperatures, precipitates metallic copper if sulphate of this metal be added, after a few minutes boiling. Inversion precedes as the solution acts strongly afterwards on the cupro potassic solution.

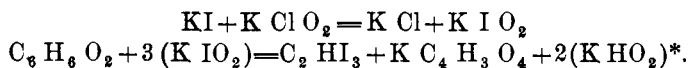
Lactose and dextrose act similarly, but more slowly.

The reduction takes place at any temperature, being slower at low temperatures.

Cupro-potassic solution is entirely reduced by concentrate solution of sugar, at ebullition ; there is production of the yellow cuprous oxide, changing after ebullition to red anhydrous oxide ; with dextrose and lactose the red oxide appears at once. There is always transformation, after long ebullition, of the oxide into metallic copper, etc., etc. (*Bul. Soc. Chim.*, **51**, 2-83.) M. L.

### Manufacture of Iodoform. H. SULLOTS and H. RAYNAUD.

The purpose of the authors was to manufacture iodoform with acetone and to transform all the iodine in iodoform. Basing themselves on the theory that the sodium hydrate transforms the iodine into hypiodite, which subsequently acts on the acetone, the authors have thought of employing a hypochlorite added to an iodide. If, as they say, they take 1 mol. acetone = 58, and 3 potass. iodide = 498, there is, after action of sodium hypochlorite in slight excess, 1 mol. of iodoform formed = 394. The reaction is represented by :



The authors have by this process manufactured iodoform on a large scale from the ashes of sea weed. (*Bul. Soc. Chim.*, **51**, **1**, 4.)

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\* (O-8.)

**Composition of Milk.** P. VIETH.

During the year 1888 there were 12,687 samples of milk taken from the railway churns for analysis in the author's laboratory. The results are as follows :

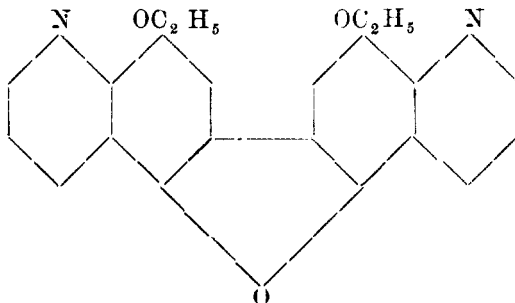
1888.	Specific Gravity.	Total Solids.	Fat.	Solids, incl. Fat.
January .....	1.0325	12.97	3.79	9.18
February .....	1.0325	13.00	3.81	9.19
March .....	1.0325	12.90	3.73	9.17
April .....	1.0324	12.81	3.68	9.13
May .....	1.0324	12.82	3.69	9.13
June .....	1.0324	12.83	3.69	9.14
July .....	1.0320	12.82	3.76	9.06
August .....	1.0319	12.84	3.80	9.04
September .....	1.0322	13.06	3.94	9.12
October .....	1.0325	13.09	3.89	9.20
November .....	1.0322	13.18	4.03	9.15
December .....	1.0321	13.01	3.91	9.10
Yearly average ..	1.0323	12.94	3.81	9.13

*Analyst*, 14, 69.

W. P. M.

**On a Diquinoleic Base.** ALBERT COLSON.

The author expresses the opinion that quinine is the hydride of a base resulting from the union of 2 mols. of quinoleine, an opinion not destroyed by the results of the oxidation of quinine made by M. Skraup. To try to throw some light on the constitution of quinine the author has had in view the formation of a diquinoleic base of known constitution and the comparison of its reaction with quinine. He describes this base and the mode of obtaining a diquinoleic base, which is dioxethylized, and seemingly a derivative of oxydiphenylene. This base has the form



The author describes its properties and concludes, from its mode of formation and the composition of its chloroplatinate, that there is no doubt about its molecular weight nor the position occupied by the quinoleic hydrogen. (*Bul. Soc. Chim.*, [3] **1**, 169.) M. L.

### Gymnemic Acid. DAVID HOOPER.

This acid is prepared from a plant (*Gymnema sylvestre*) the leaves of which have the peculiar property of destroying the power of the tongue to appreciate the taste of sweet substances. It is a brittle, black, resinous substance, of a greenish color when powdered and is best prepared from the leaf (where it exists as a potassium salt) by treating the aqueous solution of the alcoholic extract with a mineral acid, washing the precipitate and drying in a current of hot air over a desiccator. The formula is  $H(C_3H_5O_4)_2$ . (*Chem. News*, **59**, 159.) W. P. M.

### Transformation of Terpinol into a Menthenol. G. BOUCHARDAT and J. LAFONT.

The authors have prepared terpinol di-iodhydrate,  $C_{20}H_{16}2HI$ , by the action of iodhydric acid or terpine  $C_{20}H_{16}3H_2O_2$ . The principal product is a body isomeric if not identical with menthol-iodhydric ether,  $C_{20}H_{16}I$ . The body obtained and described by the authors has a composition identical with that obtained by Oppenheim by the action of  $HCl$  on the *menthol*  $C_{20}H_{20}O_2$ .

From this experiment the natural menthol ought to be allied to the *terpinol* series. This menthol  $C_{20}H_{18}O_2$  having with terpinol,  $C_{20}H_{18}O_2$ , relations comparable to those which connect allylic alcohol,  $C_6H_6O_2$ , to propylic alcohol,  $C_6H_8O_2$ .\* (*Bul. Soc. Chim.*, **51**, No. 1, 8.) M. L.

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\* O—S.

## ANALYTICAL CHEMISTRY.

### Determination of Nitric Acid. H. WILFARTH.

This method is a modification of Schlössing's, based on the decomposition of nitrates by an acid solution of ferrous chloride. The liberated nitric oxide is collected and oxidized in an alkaline solution of hydrogen peroxide and the nitric acid formed determined by the amount of alkali thus neutralized. The entire operation for determining the nitric acid by this method may be accomplished within 30 minutes when the apparatus is in working order. The working of the apparatus can only be understood with the aid of the diagram. (*Ztschr. anal. Chem.*, **27**, 441.)

J. F. G.

### On the Use of Hydrogen Peroxide for the Determination of the Metals of the Iron Family. A. CARNOT.

*Chromium.*—The action of chromic acid on peroxide hydrogen has long been known to have been first indicated by Barroswil; M. Mossin has shown that it is due to a combination of chromic acid and of  $\text{HO}_2(\text{Cr O}_3\text{HO}_2)$ . The author has found that after the peroxide has acted the chromic acid is reduced as chromium sesquioxide, and a corresponding quantity of peroxide has been destroyed. This phenomenon is employed by the author to determine hydrogen peroxide by means of a standard solution of bichromate, but better for the determination of chromic acid or a chromate. The peroxide employed is poured drop by drop in the slightly acid chromate solution till the blue color is no longer produced; a similar operation is performed with a chromate of known strength (bichromate). It is well not to act on more than 200 or 300 grms. of chromic acid. (*Bull. Soc. Chim.*, **1**, [3] 275.) M. L.

### On the Use of Peroxide of Hydrogen for the Determination of Metals of the Iron Family. 1st, Chromium; 2d, Manganese; 3d, Iron. A. CARNOT.

*Chromium.*—If hydrogen peroxide reduces chromic acid in a cold and acid oxide solution, it peroxidizes chromium, on the contrary, in a hot and alkaline or ammoniacal solution. On this is

based the gravimetric determination of chromium ; the chromium will be peroxidized in an ammoniacal solution and then, when oxidized, liberated as chromic acid by the peroxide method, or any other. The same reagent can be employed for gravimetric analysis, the chromate formed will be separated from the oxides thrown down by  $\text{NH}_3$  or its carbonate. The chromate left is then reduced by the peroxide in the acid solution, and the excess of peroxide boiled off. To be sure of its entire destruction  $\text{H}_2\text{S}$  is passed into the hot solution ; the chromium oxide is then thrown down by  $\text{NH}_3$ . Another way is to add to the solution just reduced by the hydrogen peroxide, sodium phosphate and then sodium acetate and ammonia and boil 10 or 15 minutes. Under these conditions there is obtained the precipitate of hydrated chromium oxide, the formation of which under these circumstances has already been indicated by the author. (*C. R.*, **93**, 154.)

*Manganese.*—In an ammoniacal solution of a manganous salt hydrogen peroxide precipitates a brown manganese oxide, but the precipitate retains the other bases, and it is necessary to reprecipitate several times to secure good results. The volumetric process, on the contrary, is reliable ; the author has assured himself that the composition of the precipitated oxide is constant and is represented by  $\text{Mn}_2\text{O}_3$  or  $5\text{MnO}_2 \cdot \text{MnO}$ , whether the foreign metals be calcium, baryum, zinc or iron. The available oxygen is then calculated volumetrically with oxalic acid, sulphuric acid and standard permanganate, the manganese being calculated on the basis of 5 equivalents of available oxygen corresponding to 6 equivalents of manganese.

*Iron*—Is peroxidized in the cold and in an acid solution by  $\text{H}_2\text{O}_2$  better than by any other peroxidizing agent. (*Bull. Soc. Chim.* [3] **1**, 877.)  
M. L.

### Determination of Lithium by the Fluorides. A. CARNOT.

The author has found that lithium fluoride is very sparingly soluble in cold water, and much less so in a solution of ammonium fluoride. The author indicates the purification of this reagent. The solution of the alkaline earths is evaporated to a few c. c. in

a tared platinum capsule; ammonium fluoride is added with an excess of ammonia. A gelatinous precipitate is formed which is complete after a day: a portion of the liquid is decanted on a very small filter, and replaced by a few c. c. of ammoniacal ammonium fluoride, stirred with the platinum spatula, and left to stand; this treatment is repeated several times: finally there remains only all the lithium impregnated only with  $\text{NH}_3$  and ammonium fluoride. All volatile matter is evaporated off, the ash of filter is added, is treated with  $\text{H}_2\text{SO}_4$  and calcined to obtain neutral lithium sulphate.

The results must be corrected for the solubility in washing solutions (30—50 c. c.) increasing results by 1 mg. of lithium for every 1 c. c. of wash waters. The results, according to the author, are very satisfactory. (*Bul. Soc. Chim.* [3] **1**, 280.)

M. L.

#### Determination of Ash. F. A. FLÜCKIGER.

The author calls attention to the suggestion of R. Fresenius (*Quant. anal.* II., p. 638) relative to determining ash in organic matter. The substance should be heated in a platinum dish at a temperature just sufficient to char the organic matter without igniting it. The charred mass is then moistened with water, evaporated and finally ignited. The carbon will then readily burn off. (*Ztschr. anal. Chem.*, **27**, p. 637.) J. F. G.

#### Improved Method for Analysis of Fats and Oils. MUTER and DE KONINGH.

A modified form of Muter's fat tube is used. 3 gms. of the fat are saponified by a fragment of  $\text{KHO}$  and 50 c.c. of alcohol, in a flask closed by a cork carrying a long tube the extremity of which is drawn to a fine point. After saponification, a drop of phenol phthalein solution is added, then acetic acid to slight acidity, then alcoholic potash to faint alkalinity. Then 200 c.c. boiling distilled water are placed in an evaporating dish, 30 c.c. of a 10 per cent. solution of  $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$  added, and the whole brought to a boil. Pour in the soap solution slowly with constant stirring, and cool slowly. Wash with boiling water by decantation. Scrape the



precip. into a stoppered bottle, pour on 80 c.c. *redist'd* ether, rinse up to 120 c.c. ether. Let stand 12 hours. Filter into the "fat tube," and wash with ether (about 100 c.c.; till no reaction for Pb through a filter kept covered. Pour in about 40 c.c. HCl (1:4), shake until it clears readily, let stand. Wash with water till acid removed. Make up ether solution to (say) 200 c.c. Evap. off 50 c.c. ether (not quite). Add 50 c.c. alcohol and titrate; 1 c.c. = 0.0282 oleic. Run out what will give 0.5 gm. oleic, Pass CO<sub>2</sub>, to vaporize the ether (120° C.) Add 50 c.c. Hubl solution. Run a blank. Let stand in dark 12 hrs., 35 c.c. KI, CHCl<sub>3</sub> titr. (*Analyst*, **14**, 61.) E. W.

#### Citric Acid in Lemon Juice. WILLIAMS.

The tests made are specific gravity, acidity by normal soda with phenol phthalein indicator, precipitation with moderate excess of Ca Cl<sub>2</sub> solution, filtering, ignition of the precipitate to carbonate, and titration of this with normal HCl. Titration with sodium carbonate and litmus paper is troublesome and inaccurate. (*Analyst*, **14**, 25.) E. W.

#### New Pepper Adulterant. STODDART.

A mixture of rice starch, barytes, calcium carbonate and lead chromate. The author separates by means of chloroform, and then submits the residue to examination. (*Analyst*, **14**, 37.) E. W.

#### Delicate Reaction for Fir Resin. MORAWSKI.

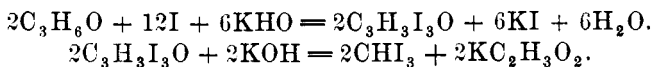
Dissolve in a little glacial acetic acid, with gentle heat, cool, and add a drop of concentrated sulphuric acid to the solution. An intense, though evanescent, reddish to bluish violet color is produced. The test can be applied to the detection of resin in paper, in soaps and in beeswax. (*Dingl.*, **271**, 47.) E. W.

#### Acetone in Methyl Alcohol. MESSINGER.

The titration requires. I.  $\frac{N}{5}$  iodine solution (in KI). II.  $\frac{N}{10}$  Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>. III. HCl (Sp. Gr. 1.025). IV. 56 gms. K HO in 1 l. water. V. flask with ground stopper, 250 c.c. capacity. VI. a 1 c.c. pipette graduated to hundredths or to tenths. VII. Starch

solution. Determine beforehand the proportion of  $\text{KNO}_2$  as impurity in the  $\text{KHO}$  for No. IV, by acidifying 20 c.c. of the solution with the  $\text{HCl}$ , after addition of 0.1 to 0.2 gms.  $\text{KI}$ , and titrating with the  $\text{Na}_2\text{S}_2\text{O}_3$ .

Mix 20 or 30 c.c. of the  $\text{KOH}$  solution (exactly measured) with 1-2 c.c. of the methyl alcohol to be tested, in the flask, and shake vigorously. Then run in a measured quantity of the iodine solution (20 to 30 c.c.), shake for 15 or 30 seconds, till the solution becomes clear, acidify with the  $\text{HCl}$ , add an excess of the  $\text{Na}_2\text{S}_2\text{O}_3$  solution, then add starch and titrate back with the  $\text{I}$  solution. The reactions are :



The excess of iodine reacts thus :



58 of acetone require 762 of  $\text{I}$ , or, if 1 gm. of material were taken, 100 cc. of the alcohol contained 7.612 times the weight of  $\text{I}$  absorbed. (*Ber. d. Chem. Ges.*, **21**, 3366.) E. W.

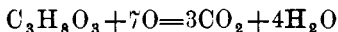
#### Determination of Glycerin. BENEDIKT and CANTOR.

By converting it into triacetin, which is then determined. Boil 1 to 1.5 grms. of the sample (with return cooler) for an hour or more with 7 to 8 grms. glacial acetic acid and 3 grms. dehydrated sodium acetate. Cool, dilute with 50 c.c. water, and warm (with return cooler) to incipient boiling. When the oil is dissolved, filter, *cool completely* and then add phenol phthalein, and neutralize exactly with dilute soda, not over half normal. Then add 25 c.c. of a standardized solution of soda, about 10 per cent., boil for 15 minutes and titrate back with half normal  $\text{HCl}$ .

The first neutralization with soda removes the excess of acetic acid. The second addition of soda saponifies the triacetin, the latter part of the process being similar to the Kœttstorfer titration. The process is applicable to crude glycerins, and also to the determinations of mono-, di- and triglycerides in fats. (*Dingl. Jour.*, **271**, 91.) E. W.

**Determination of Glycerine by Oxidation.** V. PLANCHON.

Fox and Wanklyn have proposed oxidation in an alkaline solution by potassium permanganate and determination of the oxalic acid formed. The author proposes to employ an acid solution in which the whole of the glycerine is transformed into carbonic acid by oxidation with the permanganate



The  $\text{CO}_2$  formed is absorbed and weighed. (*C. R.* 1888, **107**, 246.) M. L.

**Determination of Albumen in Urine.** H. SCHAUMANN.

The author inserts a plug of cotton into a suitable glass tube and uses this as a medium for collecting the precipitated albumen. The washed precipitate is then dried in the tube by connecting the latter with an aspirator and drawing dry air through the tube at a temperature of  $100^\circ$  to  $110^\circ\text{C}$ . After two hours drying the weighings are made at intervals of  $\frac{1}{2}$  hour until the weight is constant. (*Ztschr. anal. Chem.*, **27**, p. 635.) J. F. G.

**INDUSTRIAL CHEMISTRY.****Some Industrial Applications of Oxygen.** L. T. THORNE.

*In bleaching* with chlorine compounds, while nascent oxygen is recognized as the active agent, all attempts to employ free oxygen alone have proved unavailing. It is found, however, that when used in conjunction with chlorine, oxygen causes a more rapid decoloration than chlorine alone. It is probable that the bleaching of fibrous materials does not take place at one bound, but by stages, some of the intermediate products being of an aldehydic or unstable character, and oxidizable by free oxygen. If no free oxygen be added, the end as well as the initial oxydation must be effected by nascent oxygen supplied through the medium of

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NOTE.—It is probable that this method is not applicable in cases where the glycerine is not pure, (when mixed, for instance, with sugars, or alcohols, etc.), for the same reason that renders the Fox and Wanklyn method unreliable in many other cases. M. L.

chlorine ; but if abundance of free oxygen be present, less nascent oxygen, and consequently less chlorine, is required. The saving of bleaching material is very marked.

*In the purification of gas*, if a little oxygen ( $\frac{1}{10}$  per cent. of the volume of the gas for every 100 grains of sulphur per 100 feet crude gas) be added before the gas enters the purifiers, the lime purifiers alone will be found sufficient to remove the sulphur compounds and the life of the lime will be nearly doubled.

*Maturing of spirits*.—It has been found that if oxygen be forced into spirits at a pressure of one or more atmospheres and left for ten days or so, the spirits become mellowed to the extent of about three to five years ageing. The process is not applicable to wines, as they are often acidified by it. The author quotes the price of oxygen for use upon an industrial scale as \$1.25 to \$1.75 per thousand cubic feet. (*J. Soc. Chem. Ind.*, 8, 82.)

W. P. M.