ABSTRACTS.

GENERAL AND INORGANIC CHEMISTRY.

On the Conditions of Formation of Two Arseniates of Nicel kand on their Molecular Constitution. COLORIANO.

MM. Friedel and Sarrazin have shown that the tribasic phosphate of copper, heated with water at 100° is transformed into the compound $PO_4\left\langle\begin{matrix}Cu\\CuOH\end{matrix}\right.$ which exists in nature (liberthenite), while under similar conditions the copper arseniate heated with water gives olivenite $AsO_4\left\langle\begin{matrix}Cu\\CuOH.\end{matrix}\right.$

The author sought for similar compounds of nickel, and studied the best conditions for obtaining the crystallized arseniates; he succeeded in obtaining a mixture of an amorphous salt and a well crystallized one, which he succeeds in separating by levigation.

The crystals lose their water only at the boiling point of sulphur, the remaining $\frac{2}{3}$ only passing off at a red heat. The dehydrated substance is attacked when heated in a closed tube at 180° C. for two hours with HCl diluted with its volume of water. The results of the analysis were :

	I.	II.	III.
As_2O_5	42.26	42.30	41.06
NiO	54.44	54.86	55.44 *
H_2O	3.46	3.50	3.50

which correspond to the formula $AsO_4\left\langle\begin{matrix}Ni\\NiOH.\end{matrix}\right.$

The arseniate of nickel crystallizes in the form of hexagonal prisms, of a light green, often grouped together or mackled. They are very hard, attacked with difficulty by acids or aqua regia, and by potash cold or even hot, but are easily dissolved by hydrochloric acid diluted with its volume of water, in a closed tube at 180°. Another arseniate, yielding hexagonal crystals was produced by the digestion of arsenic acid with nickel carbonate. The result of the analysis were :

As_2O_5	46.26	46.45
NiO	46.03	46.16
H_2O	7.56	7.39
	99.85	100.00

corresponding to the formula

$$As_2O_5\,(NiO)_3\,(H_2O)_2.$$

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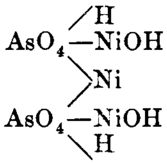
* By difference.

The author admits that the water belongs to the constitution, as it requires a red heat to drive off $\frac{9}{10}$ of the total amount of H_2O. He proposes the formula :



This arseniate is attacked with difficulty by acids and potash. Soluble in a closed tube in diluted muriatic acid at 140°. (*Bul. Soc. Chim.*, **45**, 241.) M. L.

Combination of Silver Nitrate with the Alkaline Nitrates. A. Ditte.

I. *Potassium Nitrate.*—Silver nitrate, which usually crystallizes in orthorhombic prisms, gives in concentrated solution with salpetre (3 mol. of the first to 1 of the second salt) crystals having the form of thick plates, containing the two salts in equimolecular proportions.

II. *Rubidium Nitrate.*—Gives also a salt NO_3Ag, NO_3Rb.

III. *Ammonium Nitrate.*—Similar to Rb.

IV. *Sodium Nitrate.*—No double salt is obtained, but, when the sodium salt is in sufficient proportion to deposit, it imposes its form, and only rhombohedrons are obtained, the composition depending upon the proportions of the salts.

V. *Lithium Nitrate.*—The two salts crystallize separately above 10° C.; that is to say, under the conditions in which the hydrated lithium nitrate crystallizes above 15° the results are similar to those with sodium nitrate. (*Comptes Rend.*, **101**, 878.) M. L.

ORGANIC CHEMISTRY.

On Indigo dicarbo-acid. W. Low.

Starting from terephthalic acid, the following compounds were produced :

I.

1. Terephthalaldehyde, $C_8H_4C\overset{1}{O}HC\overset{4}{O}OH$.
2. Nitroterephthalaldehyde, $C_6H_3\ C\overset{1}{O}H,\overset{2}{N}O_2,C\overset{4}{O}OH$.
3. *p.* Cinnamic carbo-acid, $C_6H_4\ CHC\overset{1}{H}COOH,C\overset{4}{O}OH$.
4. Dibromcinnamic carbo-acid, C_6H_4, $CHB\overset{1}{r}CHBrCOOH$, $C\overset{4}{O}OH$.
5. Nitrocinnamic carbo-acid, C_6H_3, $CHCH\overset{1}{C}OOH,\overset{2}{N}O_2,C\overset{4}{O}OH$.
6. Dibromnitrocinnamic carbo-acid, $C_6H_3,CHBrC\overset{1}{H}BrCOOH$, $\overset{2}{N}O_2,C\overset{4}{O}OH$.

II.

Indigo dicarbo-acid was finally obtained from nitroterephthalaldehyde by treating it with acetone and sodium hydrate solution for two hours at a temperature of 50° C. The solution turns dark green, and if dilute H_2SO_4 be now added to it, the indigo dicarbo-acid will be precipitated as a dark blue precipitate. (*Ber. d. Chem. Gesell.*, *1885*, *947.*) J. H. S., Jr.

Experiments on Diazo-compounds—Short notes of Miscellaneous character. P. Griess.

1. On a convenient manner of preparing chlor-, brom-, and fluorbenzoic acids.

The author finds that the above mentioned substituted benzoic acids may conveniently be prepared by boiling diazobenzoic acid sulphate with the corresponding halogen acids. The reaction takes place, without the formation of by-products, according to the following equation:

$$C_6H_4COOH,N\text{—}NSHO_4+Hx=C_6H_4,\ x,\ COOH+N_2+H_2SO_4.$$

For 1 pt. of diazobenzoic acid sulphate, use $\frac{3}{5}$ pts. of the required halogen acid.

2. Compounds of meta-diazobenzoic acid with nitromethane, acetacetic acid and malonic acid.

Azonitromethane benzoic acid :

$$C_6H_4,COOH,N=NCH_2(NO_2).$$

Prepared by treating an aqueous solution of metadiazobenzoic acid with an aqueous solution of nitromethane, dissolved in an excess of KOH+aq. HCl precipitates the new compound in the shape of a yellowish red precipitate, which crystallizes from alcohol in star shaped leaflets.

Azoacetacetic acid; benzoic acid.

$$C_6H_4,COOH,N=N,CH(C_2H_3O)COOH.$$

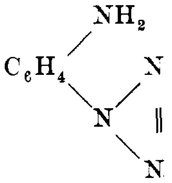
Obtained from metadiazobenzoic acid sulphate and acetacetic acid ester. Crystallizes from alcohol in small leaflets or needles.

Azomalonic acid benzoic acid.

$$C_6H_4,COOH,N=N,CH(COOH)_2.$$

From metadiazobenzoic acid sulphate, and malonic acid ether. Crystallizes from alcohol in microscopic needles or leaflets.

Metamidodiazobenzolimide (1).



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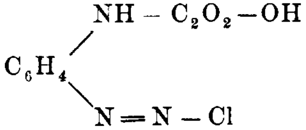
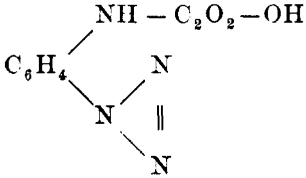


[2]

This interesting base was obtained by treating m-phenyloxaminic acid, in the presence of an excess of HCl, with KNO_2, which converts it into a diazo-compound of the formula (2), from which, according to known rules, the perbromide may be obtained. Finally, on treating this perbromide with ammonia, a new acid of the formula (3),



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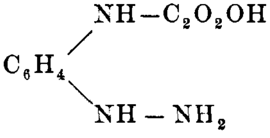
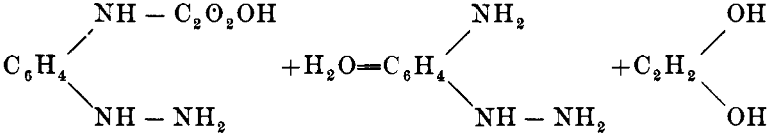


[4]

is formed, which on being heated with KOH+aq. yields oxalic acid and amidodiazobenzolimide, a slightly yellow-colored oil, with a faint odor of bitter almond oil.

Meta amidohydrodiazobenzene. C_6H_4,NH_2,NH,NH_2.

On adding a hydrochloric acid solution of tin chloride to the previously described diazo-compound (2), a new acid with pronounced hydrazin characteristics is obtained, having the formula (4). If this be now boiled with strong HCl, it gradually dissolves, and at the same time decomposes, according to the equation,



$$C_6H_4\left\langle\begin{array}{l}NH-C_2O_2OH\\NH-NH_2\end{array}\right.+H_2O=C_6H_4\left\langle\begin{array}{l}NH_2\\NH-NH_2\end{array}\right.+C_2H_2\left\langle\begin{array}{l}OH\\OH\end{array}\right.$$

3. Diazobenzol chloride—tin chloride.

$$(C_6H_5-N=N-Cl)_2SnCl_4.$$

This new double salt may be obtained if a concentrated solution of diazobenzene chloride is first mixed with an equal volume of strong hydrochloric acid, and then with a solution of tin chloride. Crystalizes in indistinct leaflets. (*Ber. d. Chem. Gesel., 1886, 960.*)

J. H. S., Jr.

On Phenylmesitylol-Carbinol and its Principal Ethers.

E. Louïse.

When benzylmesitylol is submitted to the action of nascent hydrogen, the products depend upon the energy of the reaction.

1. The hydrocarbon benzylmesitylol $C_{16}H_{18}$, and its two elements mesitylol and toluol.

2. The secondary alcohol phenylmesitylol-carbinol. Phenylmesitylol-carbinol is prepared by the action of the amalgam of sodium on acetone dissolved in dilute alcohol: the amalgam is added in small portions to avoid increase of temperature. Several days are required for the action of H. The operation is completed by heating on the water bath, after a final addition of amalgam. The mercury is then separated and the liquid slowly neutralized with sulphuric acid. The sodium sulphate having been separated by crystallization, the alcohol is distilled off and the residue is shaken with ether. The ethereal solution, after treatment with dry potas-

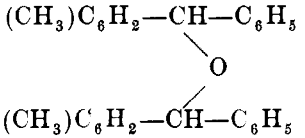
sium carbonate, is distilled. After the ether has passed off the thermometer reaches 330° and remains there, but the distillation does not give rise to any pyrogenous decomposition.

The liquid obtained is colorless, viscous, crystallizing with difficulty; even under very low temperature the crystals take several months to form. They are elongated and prismatic. Insoluble in water, soluble in alcohol, ether, acetic ether, acetone, etc. It does not crystallize from any of these solvents. The analysis gave

	I.	II.	Calculated ($C_{16}H_{18}O$.)
C	84.9	84.7	84.9
H	8.3	8.2	7.9
O	...	...	7.2

The melting point is 34°.

The alcoholic function has been well established by the formation of ethers. The ether (properly so called) results from the condensation of the alcohol in one molecule ; the composition is



$$\begin{array}{l}(CH_3)C_6H_2\text{—}CH\text{—}C_6H_5\\ \qquad\qquad\quad \diagdown\\ \qquad\qquad\qquad O\\ \qquad\qquad\quad \diagup\\ (CH_3)C_6H_2\text{—}CH\text{—}C_6H_5\end{array}$$

It is obtained by boiling the alcohol with dilute sulphuric acid. The ether is solid and resin like ; it is soluble in alcohol, but not readily soluble in ether and acetone ; more soluble yet in gasoline and chloroform. The melting point of the crystals left by evaporation of the solvent is 137°.

The author describes the mixed ethylic ether easily obtained by the action of H_2SO_4 on a mixture of the two alcohols ; the acetic ether prepared by direct combination of the alcohol and acetic anhydride ; the benzoic ether, by simple mixture of the elements, under the influence of heat. (*Bul. Soc. Chim.*, **45**, *231.*) M. L.

On the Nitration-Products of Diphenylethane.

R. ANSCHÜTZ and C. ROMIG.

Contrary to what might be expected, the compounds described previously by the authors as mono- and dinitrodiphenylethan, on being oxidized with chromic acid in glacial acetic acid solution yielded benzophenon instead of nitrobenzophenones. It is therefore surmised that the NO_2 group must replace hydrogen in the ethyliden group according to the following formulae:

Mononitrodiphenylethan = $(C_6H_5)_2C_2H_3(NO_2)$?
Dinitrodiphenylethan = $(C_6H_5)_2C_2H_2(NO_2)_2$?

(*Ber. d. Chem. Gesell., 1885, 935.*) J. H. S., Jr.

On the Action of Acetbenzalacetic ester on Phenylhydrazin. L. Knorr and A. Blank.

Acetbenzalacetic ester and phenylhydrazin react in the cold occording to the following equation :

$$C_{13}H_{14}O_3+C_6H_8N_2+O=C_{19}H_{18}N_2O_2+2H_2O.$$

The product obtained is isomeric with methyldiphenylpyrazolcarbo-acid ester, previously obtained by the authors, through the action of benzaylacetacetic ester on phenylhydrazin. On saponification it yields a carbo-acid, which at a high temperature loses 1 mol. of CO_2, and is converted into a weak tertiary base. These compounds are named by the authors isomethyldiphenylpyrazocarbo-acid ester, isomethyldiphenylpyrazolcarbo-acid and isomethyldiphenylpyrazol. (*Ber. d. Chem. Gesell., 1885, 931.*) J. H. S., Jr.

On Nitroso-Derivatives of Aromatic Diamines. O. N. Witt.

If tetramethylmetaphenylendiamine be dissolved in an excess of dilute hydrochloric acid, and to the solution so obtained a dilute and cold solution of sodium nitrite be added, drop by drop, the fluid soon assumes a dark brownish red color, and deposites a crystalline precipitate, consisting of fine needles which are collected on a filter, washed and recrystallized from acidulated water. When pure this compound crystallizes in dark, garnet-red needles with strong lustre, and dissolves in pure water yielding a wine-red solution. On analysis the above was found to be the chloride of a mononitrosotetramethylphenylendiamine,

$$C_6H_3.\ N(CH_3)_2,\ N(CH_3)_2,\ NO,\ HCl.$$

(*Ber. d. chem., Gesell, 1885, 877.*) J. H. S., Jr.

On a few Reactions of Aromatic Cyanates. R. Leuckart.

Some time since the author observed that phenyl cyanate in the presence of aluminium chloride, unites readily with aromatic hydrocarbons. Thus, by the action of phenyl cyanate on benzene, a compound of the constitution $C_{13}H_{11}NO$ is obtained, evidently formed by the union of equal molecules of cyanate and hydrocarbon.

$$C_6H_5NCO + C_6H_6 = C_{13}H_{11}NO.$$

The melting point (159°) and characteristics showed this compound to be the anilide of benzoic acid. Toluyl cyanate and naphthyl cyanate react similarly. By the action of phenyl cyanate on phenetol in the presence of aluminium chloride, a compound is obtained which melts at 166° C., and appears to result from the union of one mol. of phenetol with one mol. of cyanate. (*Ber. d. chem., Gesell, 1885, 873.*) J. H. S., Jr.

On Rosolene. E. Serrant.

Among the products of fractional distillation of colophonium, retinol or rosolene, $C_{16}H_{16}$, is a hydrocarbon that may be useful in industry and therapeutics. Its color is pale yellow, the odor almost *nil.* It is innocuous, the ingestion of several spoonfuls producing only a slight purgative effect ; insoluble in water and alcohol, soluble in ether, essential oils and carbon disulphide. It mixes with the fixed oils, but is not saponifiable. Is not oxidable by atmospheric exposure ; Sp. gravity = 0.950. It contains terebene, colophene, modified resin, cresylol, phenol and creosote. The principal constituent is retinol $C_{16}H_{16}$, boiling at 240°. Sp. gr. =0.900. Its low price recommends it as an antiseptic, and as a substitute in some cases for oils, vaseline, etc. (*Comptes Rend.*, **101**, 953.) M. L.

Oxidation of Sebacic Acid. H. Carette.

Potassium permanganate, alone or in the presence of sulphuric acid and nitric acid, give the same results.

The mixture of acids extracted by potash, after treatment with HCl and ether, has been separated by baryta into succinic acid (characterized by its melting point and by the elementary constitution), and two other acids giving soluble barium salts. One of these salts is soluble in alcohol. The first one has been regarded as pyrotartric acid, but it melts at 96.5° and not at 112°; it is the normal propyldicarbonic acid similar to the one obtained by **M.**

Reboul with the bromide of normal propyl. The second acid, the barium salt of which is soluble in alcohol, is adipic acid, melting at 148°. The oxidation of sebacic acid gives, then, succinic acid, normal propyldicarbonic acid isomeric with pyrotartric acid, and adipic acid. (*Comptes Rend.*, **101**, 1498.) M. L.

◆

ANALYTICAL CHEMISTRY.

Examination of Wines for the Detection of the Sulpho-Copulated Compound of Fuchsine and of Ordinary Fuchsines, by means of Metallic Oxides.

P. CAZENEUVE.

The coloring matter of wines is a weak acid forming insoluble lakes with many salts of lead, mercury, iron, etc.; an excess of the reagent tends to redissolve the lake, or acts upon the foreign coloring matters. The author found that the use of metallic oxides is very convenient to remove the normal coloring matter without affecting the foreign ones. He employs with success the yellow mercuric oxide, hydrated lead oxide, hydrated ferric oxide and stannous hydrate. He rejects the process based on the use of manganic oxide or lead peroxide, which acts on the foreign coloring matters, and destroys them along with the normal colors.

Mercuric Oxide.—An ordinary wine is entirely discolored by this oxide in the proportion of 0.020 gr. of yellow oxide to 10 c. c. of wine. Shake the mixture for half a minute cold. The sulpho-compound of fuchsine is left absolutely untouched. All the other fuchsines are more or less transformed.

Hydrated Lead Oxide.—This hydrate absorbs the normal coloring matter of wine in a few minutes ; boiling assists the absorption.

Two grammes of hydrate (containing 50 % H^2O) discolor 10 c. c. of wine. This reagent is as sensitive to detect the ordinary fuchsines as the mercuric oxide is for the sulpho-compound.

Hydrated Stannous Oxide.—Employed in the moist state containing 75 % water, taking 2 grs. for 10 c. c. The author detected 0.00001 grm. of sulpho-fuchsine in 10 c. c. of wine.

Ferric Hydrate.—This hydrate containing 90% water, used in the proportion of 10 grammes for 10 c. c. of wine, entirely decolorizes the wine, whether employed cold or warm, although a portion of the ferric compound passes through the filter. Ferric oxide has the advantage of not retaining artificial colors, erythrosine, for example, which are retained by the lead and the mercuric oxides. The author will take up study of the detection of azo-colors in wines. (*Bull. Soc. Chim.*, 45, 235.) M. L.

A Color-Reaction of Rhodium. E. Demarçay.

To a neutral or slightly acid solution of ammonium chloride a small excess of concentrated sodium hypochlorite is added. A yellowish precipitate is formed. If then acetic acid (20 %) be added, drop by drop, the precipitate dissolves, the liquid becomes orange color and colorless in succession, then gives a gray precipitate, and finally passes to a very deep sky blue. This color fades away in time. Care must be taken to avoid heat or excess of acid. No other metal of the platinum group gives this reaction. The reaction permits the detection of rhodium contained in $\frac{1}{10}$ of a milligr. of chlororhodate of ammonia dissolved in 3 c. c. (*Comptes Rend.*, **101**, 951.) M. L.

On a Color Reaction for Orthodiketones. E. Bamberger.

A small amount of the substance to be examined is dissolved in alcohol, and to the hot solution a drop of potassium hydrate is added, care being taken to exclude the air as much as possible. A dark red coloration is thus produced. In more concentrated solutions the coloration is almost black. On shaking with air it disappears. (*Ber. d. chem., Gesell, 1885, 865.*) J. H. S., Jr.

* * *

INDUSTRIAL CHEMISTRY.

Composition of Spirits of Wine.—Ch. Ordonneau.

The author has submitted to a fractional distillation 300 liters of old Cognac brandy. The first distillate contained aldehyde, acetic ether, acetal, and traces of propionic ether and butyric ether. The last distillate, rectified several times, gave about 1200 grms. of a product possessing the special aroma of the brandy before distillation. The author found in 100 liters of brandy:

Acetic aldehyde	3	grammes.
Acetic ether	35	"
Acetal	35	"
Normal propylic alcohol	40	"
Normal butylic "	218.60	"
Amylic "	83.80	"
Hexylic "	0.60	"
Heptylic "	1.50	"
Propionic, butyric, caproic, etc., ethers	3	"
Oenanthylic ether	4	"
" Basis-Amines "	4	"

The most striking point is the large amount of normal butylic alcohol, boiling at 116°-118°, and the presence of amylic alcohol; the constant presence of the latter in wines was noted by Henninger.

In comparing these results with those obtained by the distillation of corn, beet root and potato alcohol, the author found that the last distillate of the latter alcohols contain, propylic alcohol, amylic alcohols rotatory and inactive, pyridine, an alkaloid boiling at 180°-200° (collidine ?), and isobutylic alcohol, without any trace of normal butylic alcohol.

The presence of this last one in the wine spirits leads the author to the theory that butylic alcohol is a normal product of alcoholic fermentation produced by the elliptical ferment, whereas isobutylic alcohol would be produced by yeast. He proposes to employ the elliptical ferment (coming from wine fermentation) for the preparation of so-called industrial alcohols, avoiding in so doing the disagreeable presence of isobutylic alcohol. (*Repert. de Pharm.*, **14**, 128.) M. L.

New Process for Producing Hydrogen. F. HEMBERT AND HENRY.

Steam is first decomposed by passing over incandescent coke. The mixture of hydrogen and carbon monoxide is then put in contact at a very high temperature with steam, which decomposes and yields CO_2 and H.

A ton of coke gives by this process 3,200 cubic meters of hydrogen. The cost per cubic meter would be 0.015 francs (less than one cent for 3 cubic meters). *Comptes Rend.*, **101**, 898. M. L.

The Digestibility of Cottonseed Cake and Meal. H. Weiske, B. Schulze and E. Flechsig.

These authors give the nutritive value of cottonseed cake as somewhat higher than rape cake, and add that it is more relished by cattle.—(*Biederman's Centralblatt*, **14**, *10.*) R. W. M.

ABSTRACTS

RELATING TO FATS & ALLIED SUBSTANCES.

By R. W. Moore.

On the Sulphur contained in Caseine and the Determination of Sulphur in Proteid Substances. O. Hammarsten.

The author defends the low figures for sulphur found by him against Danilewski and gives confirmatory figures. The sulphur was oxidized to sulphuric acid by the following methods: (1.) Pure caustic potash is heated to melting with $\frac{1}{8}$ its weight of saltpetre and a few drops of water, and after cooling the substance is added and the whole is again melted and stirred. (2.) A modification, consisting in mixing the substance with soda and saltpetre before adding it to the potash, etc. (3.) Hammarsten's modification of the first or Leibig's method. The substance is dissolved in 25% nitric acid and digested on a water bath in a covered vessel until oxidation is nearly complete (in the case of glue a further addition of fuming nitric acid is necessary), and treated with sodium carbonate to effect solution (2 pts. salt to 1 pt. substance). The whole is then evaporated to dryness in a silver dish and dried at 150°–170°, when the residue is carefully burned with gradual addition of finely powdered saltpetre. (4.) Loew's modification of the Pivia-Schiff method (Ber., **17**, 50). (5.) Claesson's method (Ber., Ref. **16**, 1390). (6.) Mixter-Sauer method (Zeit. anal. chem., **22**, 581), with the modification of placing in the narrow end of the combustion tube a thick roll of platinum wire gauze to aid combustion. In throwing down and purifying the barium sulphate, Fresenius' method was used.

The substances analyzed were: caseine obtained by precipitating milk with a small amount of hydrochloric acid, dissolving in ammonia, reprecipitating with hydrochloric acid and washing with water, alcohol and ether (ash. 3—25%); caseine prepared by precipitating 3 or 4 times with acetic acid (ash. 21—10%); ovalbumen somewhat mixed with globuline obtained by coagulation by heat from hens' eggs (ash. 559%); commercial gelatine (ash. 1.74). The substances were dried at 110°-115° and the ash allowed for. The following average figures were obtained:

METHOD.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Caseine	.770	.647	.783	.729	.755	.754
Ovalbumen	1.670	1.470	1.670	....	1.620	1.580
Gelatine	.718	.680	.747	....	.746	.665

For caseine the average is .758, which the author obtained before. Since the highest results are the most trustworthy, the probable percentage is .78. As regards the value of the methods, No. 1 gives better results than No. 2; No. 3 is suitable for substances, very poor in sulphur; No. 4 is liable to loss by sudden burning; No. 5 is elegant and easily worked, an advantage which foreign salts are liable to impair, which is also an objection to No. 6, which is also less easy of execution. (*Zeit. f. physiolog. Chem.*, **9**, *273.*)

R. W. M.

On the Determination of Caseine by Precipitation with Sulphuric Acid. J. Frenzel and Th. Weyl.

20 c.c. of milk are mixed with 60 c.c. of water and 30 c.c. sulphuric acid added (1 c.c. per litre), and after standing in the cold for an hour the precipitate is collected on a filter, washed successively with water, 90% alcohol and ether, dried at 110° and weighed; the ash is then estimated. This method, which is more rapid than that of Hoppe-Seyler, showed on comparison results about 2% lower. An excess of sulphuric acid is to be avoided. (*Zeit. f. Physiol. Chem.*, **9**, *246.*)

R. W. M.

Marchand de Fecamp's Method for Determination of Fat in Milk. G. C. Caldwell and S. W. Parr.

The results obtained with Marchand's lactobutyrometer vary according to the above authors, sometimes to a great extent from the determinations by weight. This is especially noted when the cows have been fed with straw or brewer's grains, when the differences amount to 7–10%. The authors consider the addition of a few drops of alkali necessary and prefer ammonia for this purpose. It is of the greatest importance to maintain perfectly equal proportions between the ether, alcohol and water, and therefore to know, with accuracy, the composition of the ether and alcohol. The authors arrange so that 10 c.c. of milk are treated with 7.5 c.c. pure ether and 12 c.c. 80% alcohol, and under these conditions, claim that the method is reliable. (*Amer. Chem. Jour.*, *7*, *238–246.*) R. W. M.

Milk in the Paris Hospitals. Dr. Adam.

The author denies the constancy of the composition of milk which is asserted by few authorities. He also gives a figure and description of an apparatus designed to preserve milk. (*Journ. de Pharm. et de Chim., Feb. 1, 1886.*) R. W. M.

Existence of the Elements of Milk Sugar in Plants. A. Müntz.

The author refers to the difference between milk sugar and glucose, and finds that Galactose, formerly regarded as absent in plants, is chemically and physically identical with the arabinose of gum arabic; thus both of the proximate elements of milk sugar are abundantly found in the vegetable kingdom. (*Comptes Rend., 101.*)

Note on the Estimation of Resin in Soaps. C. R. Alder Wright and C. Thompson.

In the course of a number of experiments the authors found that Sutherland's process (oxidation by nitric acid) gave fair results in some cases; this is due to the fact that imperfect oxidation of the resin increases the percentage of fatty acids, and oxidation of fatty acid tends to decrease it.

The process designing to precipitate out soaps and to leave soluble resinates in solution were found unsatisfactory, as no certainty of complete separation could be attained.

The best process was found to be by that of Gladding, which consists in dissolving about 5 gm. of the separated fatty acids in 95% alcohol, saponifying with alcoholic potash with the aid of heat, cooling, making the solution up to 100 c. c. with ether, and adding finely powdered silver nitrate, which must be perfectly neutral. A known fraction of the ether solution is treated with HCl and the liberated mixture of resin and fatty acids weighed. The amount of resin is found by the application of a correction factor expressing the amount of fatty acids mixed with the resin. Gladding states that 100 c. c. alcoholic ether will dissolve 22.5 m. g. of oleic acid from pure fatty acids. The figure he found to be correct in the case of castile soap, linseed oil soap, and soaps containing a known amount of resin. The authors obtained the following results from a large number of observations :

NATURE OF FATTY MATTER IN SOAP EXAMINED.	FATTY MATTERS DISSOLVED AS SILVER SALT IN 100 CC. ALCOHOLIC ETHER.		
	MAXIMUM. M. G.	MINIMUM. M. G.	AVERAGE. M. G.
Pure Stearic Acid	16.0	8.0	11.6
" Oleic "	15.0	9.0	12.0
Nearly Pure Palmitic Acid	30.0	28.0	29.1
Cottonseed Oil	34.0	20.0	26.9
Castor Oil	62.0	49.0	53.9
Cocoanut Oil (fatty acids dried on water-bath)	17.5	12.0	14.8
Cocoanut Oil (fatty acids dried over H_2SO_4)	23.0	19.0	21.1
Stearic and Oleic Acids*	22.0	18.0	19.1
Stearic Acid and Cottonseed Oil*	....	....	25.5
Oleic Acid and Cocoanut Oil* (w. b.)	....	....	25.6
Stearic Acid and Cocoanut Oil* (w. b.)	....	....	23.4
Oleic Acid and Cottonseed Oil*	....	....	24.5

While Gladding's correction is not universally applicable, a fair approximation can be obtained in a number of cases of mixtures liable to occur in actual manufacture. The authors also call attention to two sources of error, viz., the liability of the alcoholic potash to contain resinoid matter due to the action of the potash on the alcohol or on impurities contained in it, and the decomposition of certain of the silver salts of the fatty acids by the action of light. (*Jour. Chem. Soc.*, **280.**) R. W. M.

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* In nearly equal proportions.

On the Oxidation of Glycerine in an Alkaline Solution, and an Easy Method of Preparing Pure Glyceric Acid.

E. BÖRNSTEIN.

If mercuric oxide and barium hydrate are added to a boiling aqueous solution of glycerine, a reaction takes place if the liquid is very concentrated and nearly saturated with barium hydrate; the reagents are added as long as action takes place, the liquid is precipitated with CO_2, filtered and concentrated on the water bath. After washing the salt with strong alcohol to remove glycerine, it is decomposed by exactly enough sulphuric acid, and pure glyceric acid is obtained. The calcium salt separates from the aqueous solution on addition of alcohol in groups of glistening, white plates. The method is very satisfactory, as 45% of the glycerine used can easily be oxidized to glyceric acid. (*Ber. d. chem., Gesell,* **18**, *3.358.*)

R. W. M.

Preparation of Soluble Magnesia Soaps.

M. Rotten (D. R. P. Cl. 23, No. 34, 308) prepares these soaps by treating with magnesium chloride or other soluble salt and then treating the insoluble precipitate with caustic or carbonated alkali, either directly in the solution or after the washing and pressing.

Soluble magnesia soaps can also be obtained by treating first with alkali and then with magnesium compounds. The soluble soaps are obtained in a compact form by evaporating the solution. (*Ding. Pol. Jour.*, **259**, *432.*) R. W. M.

On the Products of the Dry Distillation of some Silver Salts of Fatty Acids. FR. IWIG AND O. HECHT.

Chevenix states (Gilbert's Ann, 32, 179) that pure acetic acid free from acetone is obtained by distilling silver acetate; also carbon dioxide and an hydrocarbon were driven off, while a mixture of 95% silver and 5% carbon remained behind. The reaction is supposed to be:

$$4CH_3-CO_2Ag=2CH_3-CO_2H+C_2H_4+2CO_2+4Ag.$$

A preliminary experiment showed that the distillation began at 210°, and the decomposition took place completely at 240°. The distillate was found to be pure acetic acid melting at 10°. The purity was tested by the analysis of its silver salt obtained by fractional saturation. The fractions gave No. 1, 64.3%, No. 2, 64.3%, No. 4, 64.4%, No. 5, 64. 4% of Ag. The theoretical amount being 64.6% Ag. The residue gave up nothing to ether and contained about 3.2% carbon.

A determination of the gases given off showed that the reduction was,

$$4CH_3—CO_2Ag=3CH_3—CO_2H+CO_2+C+4Ag.$$

The distillation of silver butyrate yielded only CO_2 and normal butyric acid. The reaction is

$$8C_4H_7O_2Ag=7C_4H_8O_2+3CO_2+3C+8Ag.$$

The butyric acid obtained was not perfectly pure. On redistilling it a small amount of a brown liquid was left which boiled at a high temperature. The acid was identified by the analysis of its calcium salt. These two determinations point to a general formula,

$$2_nC_nH_{2n}—_1O_2\,Ag.=(2n—1)\ C_nH_{2n}O_2+CO_2+(n—_1C+2_nAg.$$

(*Ber. d. Chem. Gesell*, **19**, *242*.) R. W. M.

New Method for taking the Fusion and Solidification Points of Neutral Fatty Bodies and of their Acids. M. Loveton.

This method consists in recording the magnified phenomena observed on submitting to the microscope a preparation made with the substance in question, and capable, without removal, of being made to vary in temperature at will. (*Journ. de Pharm. et de Chim.* [*6*], **13**, *2*.)

Detection of Mineral Oil in Resin Oil.

According to Finkener mineral oil can be detected in resin oil by the difference in solubility, in a mixture of 10 volumes of alcohol (Sp. gr., 818 at 15.60) and 1 volume of chloroform. Rosin oil dissolves completely in ten parts at 23°, mineral oil will not dissolve even in 100 pts. (*Mitt. aus der Königl. tech. Versuchsst. zu Berlin, 1885, 160.*) R. W. M.

On the Fat contained in Cochineal. E. RAIMAN.

The ether extract yields to water its red color, and on evaporation a brownish lard like mass remains from which crystalline grains soon separate. On saponification glycerine and fatty acids are obtained ; on separating the latter, saponifying and extracting with ether, a yellow waxlike body goes into solution, which on recrystallization from alcohol gives a compound melting at 66.6° $C_{36}H_{72}O$, and a substance melting to a transparent mass at the temperature of the hand, $C_{16}H_{26}O$. The separated fatty acids yielded after treatment with lead acetate, myristic and oleic acids. (*Monatsschrift für Chem.*, **6**, *892.*) R. W. M.

Abstracts of American Patents Relating to Chemistry.

(*From the Official Gazette of the U. S. Patent Office.*)

February 9th, 1886.

335,586.—Bone black discharger for continuous filters. R. C. Howes.

335,602.—Bone black discharger for continuous filters. F. O. Matthiessen.

335,622.—Continuous filter for purifying sugar liquors by bone black. E. E. Quimby.

335,624.—Process of reducing magnetic oxide of iron. D. Reynolds.

The ore is reduced by the vapor or gases of burning petroleum.

335,699.—Sulphuric acid tower. J. B. F. Herreshoff.

335,707.—Manufacturing artificial stone. G. Lilienthal.

Consists of slaked lime, Keene's cement, and curdled milk.

335,763.—Apparatus for decolorizing sugar liquor by filtration through bone black. F. O. Matthiessen.

335,957.—Apparatus for refining tallow and other lubricating oils. G. J. Pilkington.

335,958.—Process of separating the fiber of cocoons.

The cocoons are subjected to the action of hydrochloric acid at a temperature of 65°.

335,962.—Converting petroleum and similar hydrocarbons into acids. E. Schaal.

The hydrocarbons are treated with an oxidizing agent in the presence of an excess of alkalies, alkaline earths or their carbonates, and the organic acids are separated from the resulting salts by mineral acids.

336,013.—Sizing paper. A. Mitscherlich.

Rosin, soap or glue is precipitated in the pulp by tanning materials.

336,018.—Composition for insulating electric wires. W. J. Rigney and J. Wolff.

336,073.—Method of clarifying beer and charging the same with carbonic acid gas. T. T. Straub.

February 16th, 1886.

336,205.—Filtering material. F. Breyer.

Made by felting finely divided asbestus fibers to a fibrous backing.

336,206.—Process of producing filtering media. F. Breyer.

Asbestus is ground with a crystalline carbonate or shells, after which the carbonate is dissolved out by acids.

336,233.—Machine for the manufacture of ice and for refrigerating purposes. E. E. Hendrick.

336,234.—Process of reducing temperature. E. E. Hendrick.

336,235.—Machine for cooling liquids and other articles, commonly called "Ice Machines." E. E. Hendrick.

336,378.—Automatic gas generator. O. W. Bennett.

336,385.—Filtering compound. C. E. Chamberland.

Consists of porcelain earth baked and reduced to powder, and pipe clay.

336,386.—Filtering compound. C. E. Chamberland.

Consists of earthenware clay, and biscuit formed of said clay.

February 23d, 1886.

336,546.—Analytical Balance. E. Becker.

336,569.—Composition for Sizing Paper. J. Jordan.

Consists of wax, oil and silicate of soda.

336,621.—Filter. A. Breuer.

A porous body is produced by combining a soluble and an insoluble body, which will set or agglommerate when moistened, like hydraulic cement and salt, and lixiviating the resulting compound.

336,675.—Method of Producing Imitation Stone. H. S. Utley.

336,792.—Process of Separating Precious Metals from Speiss. St. George T. Bryan.

A blast of air is forced through the molten mass, until arsenic and other oxidizable substances are driven off; then lead is added to the molten mass, and the blast is continued until the lead, and gold and silver have sunk to the bottom.

336,795.—Process of Extracting Glycerin from Fatty Substances. J. H. Clinton.

The fatty substance is placed in a closed digester, with the addition of one per cent. of lime, and a suitable amount of water, and a zinc bar is suspended in the mixture. Steam is then forced into the charge for about five and one half hours, until the saponification is completed.

336,799.—Filtering Fabric. S. G. Derham.

Consists of layers of filtering or blotting paper, and layers of textile fabric united by stitching.

336,822.—Art of Manufacturing Nitro-Cellulose. F. V. Pool.

March 2d, 1886.

336,912.—Gas apparatus. G. W. Gogin.

336,941.—Process and apparatus for distilling oil. J. W. Norton and F. H. Rouse.

336,952.—Production of cold and manufacture of ice, and apparatus therefor. A. Schmitz.

336,965.—Process of preparing food for animals. C. H. Voigt.

The liquid obtained by treating straw and similar substances with alkalies, is precipitated with sulphuric acid, and the precipitated organic matter lixiviated.

337,026.—Purifying water. H. H. Smith.

Water is filtered through sand coated with lime.

337,035.—Soap. C. H. Walker.

Consists of beef tallow, water, rosin, potash, sal soda, pearline, borax, sodium sulphate, salts of tartar, camphene, ammonia, benzine, turpentine and oil of sassafras.

337,197.—Apparatus for the production of pure sulphurous gas. F. Randon.

337,246.—Process of purifying coal gas and obtaining ammonia and other products. C. F. Claus.

W. R.

PROCEEDINGS OF THE AMERICAN CHEMICAL SOCIETY.

Regular Meeting, April 2d, 1886.

Prof. A. R. Leeds in the chair.

Minutes of the meeting of February 5th were read and approved.

Minutes of the meeting of the Board of Directors of February 9th were read.

The Committee on Furtherance of Special Investigations reported progress.

The following new members were elected: Dr. Bennett F. Davenport, of 751 Tremont street, Boston, Mass.; Prof. Charles W. Parsons, of the College of Pharmacy, 211 East 23d street, New York; Mr. Edward W. Martin, The Rutland, 59th street and Broadway, New York City.

Mr. Robert Senger, of 423 East 78th street, New York City, was proposed as a member.

Mr. Casamajor exhibited some crystals of raffinose. Dr. Endemann made some remarks on the Analysis of and Detection of Adulteration in Beeswax.

Mr. Casamajor, as chairman of the committee for celebrating the Tenth Anniversary, reported progress.

The meeting was then adjourned.

C. E. MUNSELL,
Recording Secretary.

ABSTRACTS.

GENERAL AND INORGANIC CHEMISTRY.

On the Formation of the Deposits of Sodium Nitrate.

A. Müntz.

Usually, the phenomena of nitrification give rise to calcium nitrate and not to sodium nitrate. The explanation may be deduced from the following considerations.

Müntz and Schloesing have proved that nitrification is produced by a ferment as the presence of calcium phosphate shows. Iodine and bromine, which are found only as iodides and bromides in nature, exist as iodic and bromic acids in the nitrate deposits; this oxidation can be produced by the ferment of nitrification.

The presence of iodine and bromine in notable amount in sea water leads the author to believe that sea water took part in the formation of the deposits, and that this interference happened at the time of the nitrification; at the same time a double decomposion occurred between the sea salt ($NaCl$) and calcium nitrate. Experiment proves that nitrification can occur in presence of sea salt, and that a mixture of salt ($NaCl$) and of calcium nitrate gives a deposit of sodium nitrate. The author believes that the formation of the Peruvian nitrate happened elsewhere than at the place of actual deposit. (*Bul. Soc., Chim.* **45**, *340.*) M. L.

Process of Preparation of Phosphoric Acid. A. Joly.

Ammonium phosphate is treated with $H\,Cl$ and slightly warmed; after cooling muriate of ammonia separates. The acid liquid is a solution of phosphoric acid with some ammonium chloride. This latter salt is removed by adding nitric acid in small portions till all NH_3 and HCl are expelled. When free from these bodies, the phosphoric acid is evaporated in a platinum capsule, to drive off the excess of nitric acid. The author prepares the monammonium phosphate with the ordinary ammonium phosphate by dissolving it in boiling water and adding HCl to slight acid reaction (detected with orange No. 3). The liquid on cooling yields the monammonic phosphate well crystallized. (*Bul. Soc. Chim.*, **45**, 329.) M. L.

Preparation of Vanadyl Chloride. L. L'Hote.

Pulverized vanadite is mixed with 4 times its weight of lamp black; the mixture, made into paste with oil, is calcined and put into a hard glass tube and heated in an oil bath. Dry chlorine is passed into the tube, and the vanadyl chloride more volatile than the other chlorides (of calcium, manganese, iron, copper, lead, arsenic, etc., which exist in vanadite) passes off and condenses in the bulbs. Although the chloride passes off at 210° C, the heat is brought to 300° C. The chloride is of a gold yellow color, and evolves reddish fumes. It boils at 126°5. Sp. Gr. 1.854 at 18°C. The composition is $VOCl_3$. (*Comptes Rend.*, **101**, *1151.*) M. L.

Influence of Acid Ammonium Oxalate on the Solubility of Neutral Oxalate. R. Engel.

When a saturated solution of neutral ammonium oxalate is acidified with oxalic acid no acid salt is precipitated, as has been generally stated, but the salt thrown down is neutral oxalate. By increasing the amount of oxalic acid a mixture of neutral and acid oxalate is precipitated. If in a mixture of 2.38 parts of neutral oxalate and 2.9 of acid oxalate, oxalic acid be added, it is found that no increase of oxalic acid or ammonia can be found in the solution, as long as neutral oxalate remains in solution, acid oxalate being the result of this transformation. (*Bul. Soc. Chim.*, **45**, 315.) M. L.

ORGANIC CHEMISTRY.

Action of Acetic Acid on French Oil of Turpentine. G. Bouchardat and J. Lafont.

The authors have already shown that acetic acid combines at 100° C. with terebene, forming an acetic ether of a camphene, inactive to polarized light. They have obtained identical combinations with the lævorotatory French oil of turpentine, but the action is multiple producing univalent hydrocarbons and terpilene, a bivalent hydrocarbon.

The authors have put in contact with acetic acid for six months one volume of French oil of turpentine the deviation of which was $\alpha_D = 33°34'$ for 10 cm. length of tube. The products of the action were distilled, yielding at least four different products.

The first portion has the properties of the original oil, but higher rotatory power, viz.: $[\alpha]_D=44°.95$, whereas the rotatory power of the oil is $[\alpha]_D=39°.6$.

The product passing between 170–180° has the composition of oil of turpentine ; density 0.86, rotatory power higher : $[\alpha]_D=62°15$. Its chemical properties are those of citron oil ; like it gives with Cl a dichlorhydrate, identical with the dichlorhydrate of terpilene. From their experiments it appears that the oil of turpentine combines, even when cold, with acetic acid, and yields monacetates of the terpene series and of the terpilenic series ; at the same time the uncombined oil is transformed into two hydrocarbons, $C_{20}H_{16}$; one univalent, like turpentine oil ; the second bivalent or active terpilene. (*Bul. Soc. Chim.*, **45**, *291.*)

M. L.

On the Behavior of the different forms of Carbon towards Iron at High Temperatures. W. Hempel.

(*Ber. d. Chem. Gesell.*, *1886*, *998.*) J. H S., Jr.

Transformation of Oil of Turpentine into Optically Active Terpilene. (G. Bonchardat and J. Lafont.)

The authors have submitted oil of turpentine to the action of chromic acid in glacial acetic acid, then have distilled in partial vacuum. The products passing at distillation under 185° yield two fractions, one boiling at 155–156°, the other at 174–178°. Both have composition $C_{10}H_{16}$. The first has nearly the same properties as the original oil, but has a higher rotatory power.

The second hydrocarbon, boiling at 174–178°, has the principal properties of oil of lemon. It rotates to the left ; the rotatory power being $[\alpha]_D=56°$. It is readily oxidable when pure ; the oxidation takes place inside of a month in a glass stoppered flask. The action of chlorine produces a dichlorhydrate identical with the chlorhydrate of terpilene or citron oil.

$$C_{10}H_{16}2(HCl)=33.44\%.$$

In no portion could the authors find even a trace of solid monochlorhydrate. They give to the new hydrocarbon the name of laevorotatory terpilene. The rotation, after elimination of small quantities of cymenol, is near—65°, whereas citron oil is+104°9. (*Bul. Soc. Chim.*, **45**, *171.*) M. L.

New Synthesis of an Inactive Borneol. G. Bouchardat and J. Lafont.

The authors have succeeded in converting the hydrocarbons $C_{10}H_{16}$ (oil of turpentine, camphene) directly into borneol. They transformed terebene or camphene into an ether of borneol, which then by saponification gave optically inactive borneol.

The authors describe the preparation of terebene acetate $C_{10}H_{16}(C_2H_4O_2)$; it is a liquid with an odor resembling oil of thyme ; Sp. gr. at 0°=0.977 ; boiling at 215°. It does not act on polarized light, the deviation for a thickness of 5 cm. being between $+0° 2'$ and—$0° 4'$.

Treated at 100° for 10 hours by alcoholic potash it yields acetic acid and borneol.

$$C_{10}H_{16}(C_2H_4O_2)+KHO=C_{10}H_{16}(H_2O_2)+C_2H_3KO_2.$$

Inactive borneol is solid at the ordinary temperature, and has a more pronounced odor than natural borneol. It boils without alteration at 208–211° C., and sublimes like camphor at lower temperatures; it melts after purification at 185.5–190°. It contains 77.1% C.—11.6 H. All the properties, except optical inactivity, are those of borneol. (*Bul. Soc. Chim.*, **45**, *164.*) M. L.

Researches on the Coagulation of Egg Albumin. E. Vareune.

The author has studied the influence of different salts on the coagulating point of egg albumin. In some cases the coagulation is produced at a low temperature, in others it is not produced even at 100° C.

White of egg, prepared according to the directions of Würtz, gives two coagulations: the first at 60° is characterized by a well marked turbidity; the second at 75° is characterized by the presence of flocks. The author gives at length a description of his experiments with sodium chloride, magnesium sulphate, cadmium sulphate, uranium acetate, copper sulphate, barium chloride, barium nitrate, ammonium molybdate, urea nitrate, sodium hyposulphite, potassium iodide, mercury biniodide, iron sulphate, sodium arseniate, potassium chlorate, tartar emetic, sodium sulphate, manganese sulphate and sodium borate. (*Bul. Soc. Chim.*, **45**, *427.*) M. L.

On Amyl Monochloracetate. L. Hugounenq.

The author prepares this ether by the action of sulphuric acid on a mixture of crystallized monochloracetic acid and amylic alcohol boiling at 132° C. After a few minutes boiling with reflux, the mixture is thrown into cold water. The insoluble portion, washed and dried on calcium chloride, gives a liquid boiling at 187–194° C., with vapor density of 5.7. It is a colorless liquid, having the fruity odor of amyl acetate, is almost insoluble in water, very soluble in alcohol. Sp. gr. at 0°=1.063; boiling point at 751.5 mm., is 190° C. (*Bul. Soc. Chim.*, **45**, *328.*) M. L.

On Paranitro-benzyliden Chloride. Y. Zimmermann and A. Müller.

P-nitrobenzalde is added gradually to twice its weight of phosphorus pentachloride; the aldehyde first melts and then dissolves in the phosphorus pentachloride.

After all the aldehyde has been added, the mixture is heated for a short time on the water bath, then allowed to cool and poured into ice water. The new compound is by this means precipitated as an oil, but soon becomes solid and crystalline.

The *p*-nitrobenzyliden chloride thus obtained is easily soluble in ether and alcohol, but insoluble in water. It crystallizes in well-defined prisms, and melts at 46° C. (*Ber. d. Chem. Gesell., 1885, 996.*) J. H. S., Jr.

Nitrils from Formiated Aromatic Amines. Th. Gasiorowski and V. Merz.

The authors surmised that if the elements of water should be removed from formanilide, by heating the latter with zinc dust, that it would first be converted into a pseudo-cyanide, and then into a nitril, thus:

(1.) $C_6H_5{-}N{-}CHO{-}H + Zn = C_6H_5{-}N{=}C + ZnO + H_2$.

(2.) $C_6H_5{-}N{=}C = C_6H_5{-}C{\equiv}N$.

This hypothesis was fully verified by distilling a mixture of formanilide and zinc dust, etc. (*Ber. d. Chem. Gesell., 1885, 1001.*) J. H. S., Jr.

On Derivatives of Benzenylamidoxime. P. KRUGER.

Benzenylamidoxime, $C_6H_5C—NH_2=NOH$, is produced by the direct union of benzonitril with hydroxylamine. It unites with acids to form well defined salts.

It also unites with bases to form unstable salts, which may even be decomposed with CO_2. Ethers, according to the general formula $C_6H_5C—NH_2$ $(=NOR)$ may easily be obtained, if the sodium salt of benzenylamidoxime, dissolved in alcohol, be heated under return cooler, with the necessary alkyl-haloid.

Azoximes may also be obtained by the action of benzoic acid, benzoic anhydride, benzoylchloride and benzotrichloride, upon benzenylamidoxime. (*Ber. d. Chem. Gesell.*, *1885*, *1053.*)

J. H. S., JR.

On the Behavior of Amidoximes and Azoximes. F. TIEMANN.

Mineral acids react on the amidoximes, attacking at first the oximide group. $R\ C\ (=NOH)\ NH_2+H_2O=R\ CONH_2+H_2NOH$ and forming acid amides.

An analogous reaction takes place when sodium nitrite is allowed to react upon the chlorides of the amidoximes thus :

$$R—C\ (=NOH)—NH_2—HCl+NaNO_2=R—CO—NH_2+NaCl+N_2O+H_2O.$$

The ammonia residue of the amidoximes is acted upon by carbanil and phenyl mustard oil, forming uramidoximes and thiouramidoximes, according to the following formulæ:

$R—C\ (=NOH)\ NH—CO—NHC_6H_5$, and $R—C\ (=N—OH)—NH—CS—NHC_6H_5$, etc.

J. H. S., JR.

(*Ber. d. Chem. Gesell.*, *1885*, *1060.*)

ANALYTICAL CHEMISTRY.

Quantitative Analysis by Electrolysis. A. Classen and R. Ludwig.

SEPARATION OF ANTIMONY FROM TIN.

The precipitation of antimony in the presence of tin is accomplished by using a concentrated solution of sodium sulphide, to which a certain amount of caustic soda has been added; the current strength is equal to 1.5—2 c. c. of oxy-hydrogen gas per minute. After the current has acted for 12 hours, it is stopped and the contents of the platinum dish are poured into a second tared platinum dish, and the antimony precipitated in the first dish, may, after rinsing and drying, be weighed. In order to estimate the tin, the solution of sodium sulphide in the second dish must be converted into ammonium sulphide, as tin cannot well be precipitated from solutions of potassium and sodium sulphides. In order to accomplish this, the solution is treated with 25 grms. of ammonium sulphate, free from iron, and heated very carefully in the covered dish, until the evolution of H_2S has ceased. The solution is then boiled for 15 minutes. When thoroughly cold any sodium sulphate which may have been precipitated is dissolved in water, and the whole submitted to electrolysis with a current of 9—10 c. c. of oxy-hydrogen gas per minute.

SEPARATION OF ARSENIC, ANTIMONY AND TIN.

Should the mixture of metals be in the shape of sulphides, these are oxidized with concentrated hydrochloric acid and potassium chlorate, and the acid is then driven off by heating on the water-bath. The residue is rinsed with HCl into a 500 c. c. flask, and treated with 20—25 c. c. ferrous chloride and enough concentrated HCl to make up 200 c. c. A stream of HCl gas is now passed into the acid solution until it is completely saturated, and, for security, continued for one half hour longer. The mixture is now distilled in a current of HCl gas, till only 50 c. c. of solution remain. The distillate is collected in a 1 litre flask, containing about 400 c.c. of water. If the retort is well cooled during the distillation, no arsenic is lost. The arsenic may be precipitated from the distillate, according to Bunsen's method, as tersulphide. In order to estimate the antimony and tin, the 50 c. c. of strong acid residue remaining from the distillation are diluted with three volumes of water. Sb and Sn are precipitated by H_2S. After the sulphides have settled, the supernatant liquid is filtered, and the precipitate washed several times by decantation with hot water, and finally thrown upon a filter and washed with hot water until HCl can no longer be detected in the filtrate. The precipitate is dissolved in sodium sulphide, placed in a tared platinum dish, and, after adding the necessary amount of pure NaOH, it is electrolysed, as previously described. (*Ber. d. Chem. Gesell*, *1885*, *1104*.)

J. H. S., Jr.

Determination of Chromium. H. Vignal.

The principle of the process is the conversion of chromium into chromic acid, reduction of this oxyde by ferrous oxide and estimation of the amount of iron peroxidized.

$$6FeO+2CrO_3=3Fe_2O_3+Cr_2O_3$$

P being the weight of iron peroxidized, the weight of chromium will be $P\times 0.313$.

The solution of chromium is treated by potassium permanganate in presence of nitric acid; the end of the oxidation is shown by the action of the permanganate on the manganous oxide in solution and appearance of manganese dioxide. The filtrate contains the chromium in the state of chromic acid; it is estimated by its oxidizing action on ferrous salt and estimation of the non-oxidized ferrous oxide by permanganate. The solution of chromic acid is filtered through asbestos, or, after cooling, on paper previously moistened with hot, dilute nitric acid.

The following formula shows that 1.81 grms. permanganate are, theoretically, sufficient to oxidize 1 grm. of chromium

$$6KMnO_4+5Cr_2O_3=10CrO_3+3K_2O+6MnO.$$

An opproximation can be obtained by measuring the amount of permanganate necessary to produce this reaction, but experience shows that the amount of chromium found is $\frac{1}{10}$ too high. To estimate chromium in steel, the anthor dissolves 1 grm. in HNO_3 of 22° Baumé, then adds 0.02 grm. permanganate or 1 c. c. of a solution of permanganate (20 grms. per litre). This quantity is enough for an alloy containing not more than 1% Cr. The chromo-pig-irons and ferro-chromes are not dissolved by HNO_3, but H_2SO_4

does dissolve them. The author takes ½ grm. alloy and dissolves it in 15 c. c. of water and 5 c. c. of acid. After solution he adds 25–30 c. c. HNO_3 at 36° B., boils and adds permanganate. Ores are attacked by sodium carbonate and potassium nitrate, one part of ore and one of each salt. The portion soluble in water contains the chromic acid. (*Bul. Soc. Chim.*, **45**, *177 and* **45**, *434.*) M. L.

Oxycellulose for Determination of Vanadium. G. Witz and F. Osmond.

The process is based on the property of oxycellulose to attract and retain basic coloring matters and generally the metallic oxides of the dissolved salts.

The proportion of base retained by a given weight of oxycellulose is a fraction of the proportion of the base in the bath. If the base is colored or able to produce colored reactions, the shade, the intensity, the irregularities even of the coloration can furnish qualitative and quantitative indications. The authors fix vanadium on oxycellulose and determine its amount by the formation of aniline black. The operations are:

Preparation of calico bands, partly converted into oxycellulose. 2d. Immersion during a certain time in the liquids in which vanadium is to be detected. 3d. Printing with mixtures for aniline black, less the vanadic compounds. 4th. Development of the black in the oxidizing chambers. (*Bul. Soc. Chim.*, **45**, *309.*) M. L.

A New Method for the Determination of Uric Acid. J. B. Haycraft.

Solutions required:

1. Centinormal ammonium sulphocyanide. Dissolve about 8 grms. of the salt in 1 litre of water and standardize with decinormal nitrate of silver solution. 1 c. c. $\frac{n}{100}$ = .00168* grms. of uric acid.

2. A saturated solution of ferric alum.

3. Nitric acid of 20–30%. Dilute and boil, after which preserve in a dark bottle.

4. Ammonia solution.

5. Ammoniacal silver solution. Dissolve 5 grms. silver nitrate in 100 c. c. of water and add enough ammonia to make the solution clear.

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* Should be .00084.—J. F. G.

Process : To 25 c. c. of urine free from albumen, add about 1 grm. of sodium bicarbonate and 2–3 c. c. of water of ammonia.

1–2 c. c. of the silver solution are now added, and the uric acid is thereby precipitated as silver urate. Wash the precipitate with water until free from soluble silver salts then dissolve the same in a few c. c. of the nitric acid solution and titrate the solution thus obtained with the ammonium sulphocyanide solution, using the ferric alum as indicator. The number of c. c. of the $\frac{n}{100}$ sulphocyanide solution used multiplied by .00168* grms. will give the amount of uric acid.

The process depends upon the precipitation of the uric acid as silver urate which is insoluble in ammonia but soluble in nitric acid. (*Zeit. Anal. Chem.*, **25**, *165.*) J. F. G.

A Reagent to Detect the Acid Function of Weak Acids, etc. R. Engel.

The author makes use of the soluble blue C.L.B. of Poirrier. This blue is an acid (sulpho-copulated rosaniline blue), forming a soluble calcium salt. The potassium and sodium salts of this acid are red. The reagent shows the acid function of bodies neutral or basic to litmus. Experiments were made upon phenol (monobasic) and resorcine (shown to be bibasic). Morphine, which has a phenolic function, is found to be acid ; univalent alcohols act on the reagent; polyvalent alcohols (glycerol, erythrol, mannitol, etc.), manifest an acid tendency ; aldehyde and chloral have a monobasic acidity, etc., etc. Salicylic is monobasic with all reagents, whereas its isomer para-oxybenzoic acid is bibasic, using soluble blue as an indicator. The titrations were made with normal potash, using quantities of the body to be classified equal respectively to 1 molecular weight, ½ m.w., or $\frac{1}{10}$ m.w. dissolved in 1 litre. (*Bul. Soc. Chim.*, **45**, *321.*) M. L.

Determination of Phenol in Crude Carbolic Acid. J. Tóth.

The author has improved the process of Koppeschaar (*Zeit. anal. Chem.* **15**, 233) by proceeding as follows : To 20 c. c. of crude carbolic acid add 20 c. c. KOH solution, Sp. gr. 1.25–1.30,

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* Should be .00084.—J. F. G.

mix thoroughly and after ½ hour dilute with water to 250 c. c. Allow the tarry matter to separate, filter, and wash the residue until the washings are no longer alkaline. Add hydrochloric acid to slight acid reaction and dilute the whole to 3 litres. To 50 c. c. of this solution add 150 c. c. bromine solution, and 5 c. c. of concentrated hydrochloric acid. Shake the mixture frequently during 20 minutes, then add 10 c. c. KI solution, allow to stand for 5 minutes, then add starch solution and titrate with sodium hyposulphite.

The solutions used are prepared as follows :

1. Sodium hyposulphite solution.

9.763 grms. of the crystals per litre.

2. Bromine solution.

2.040 grms. sodium bromate, and 6,959 grms. sodium bromide per litre.

3. Potassium iodide solution.

125 grms. KI per litre.

The relation between these solutions must be accurately determined. The quantity of carbolic acid is calculated according to the reaction.

$C_6 H_5 OH + 6 Br = 3 HBr + C_6 H_2 OH Br_3$.

A known amount of bromine having been used, the amount combined with the carbolic acid is determined by the difference between the amount added and that found by the titration with sodium hyposulphite. (*Zeit. anal. Chem.*, **25**, 160.) J. T. G.

On the Detection of Orange and Yellow Colors in Wines.

P. CAZENEUVE.

The author uses mercuric oxide, hydrated lead peroxide, and ferric hydrate. As for the red colors the ferric hydrate is considered by the author as the most satisfactory reagent in use.

The amount of hydrates used for 10 c. c. of wine are :

0.020 grs. yellow mercuric oxide.
2 grs. lead hydrate (50% water).
10 grs. ferric hydrate (90% water).

The mixture is boiled and filtered. These quantities were found suitable for 0.0001 grm. coloring matter in 10 c. c. wine. (*Bul. Soc. Chim.*, **45**, *422*.) M. L.

Detection of Artificial Red Coloring Matter in Wines. P. Cazeneuve.

The author studies the action of metallic oxides on the red derivatives of tar oil. He recommends the use of gelatinous ferric hydrate above all, as it retains only the normal coloring matter of wine and permits artificial colors to pass except safranine (derivative of triamidotriphenylamine), which passes only in quantities above .0002 grms. in 10 c. c. (*Bul. Soc. Chim.*, **45**. *420.*) M. L.

Preparation of Pure Hydrobromic Acid. J. S. Stas.

The acid is prepared from red phosphorus, bromine and water according to the customary method. The bromine, however, is first freed from traces of chlorine and iodine by dissolving it in potassium bromide, and then distilling it in presence of zinc oxide, whereby the chlorine is retained as potassium chloride and any iodine as zinc iodide. (*Zeit. Anal. Chem.*, **25**, *213. From Ber. d. d. Chem. Ges.*, **18**, *2076.*) J. F. G.

Kjeldahl's Method for Nitrogen Determinations. A. Rindell and F. Hannin.

To obviate the carrying over of sodium hydrate during the distillation of the ammonia, the authors have improved the "safety tube" attachment of Pfeiffer and Lehman (*Zeit. Anal. Chem.*, **24**, *388*) introduced between the distilling flask and condenser, by placing within a large tube of about 25 mm. diam. a smaller tube of 10–12 mm. diam. filled with glass beads to the height of 8 cm. (*Zeit. Anal. Chem.*, **25**, *p. 155.*) J. F. G.

A Modification of Kjeldahl's Method. Dr. P. Kulisch.

The author finds that the addition of metallic mercury to the sulphuric acid, used for the preliminary destruction of the organic matter by the Kjeldahl method, saves even more time than by the use of cupric sulphate. (*J. Am. Chem. Soc.*, *7*, *291.*) The sulphuric acid which he prefers is a mixture of equal volumes of concentrated and fuming sulphuric acids, containing 100 grms. of phosphoric anhydride per litre. (*Zeit. Anal. Chem.*, **25**, *149.*)

J. F. G.

ABSTRACTS

RELATING TO FATS AND ALLIED SUBSTANCES.

By R. W. Moore.

Thermochemical Relations of the Acids and Alcohols of the Fatty Series. F. Stohman.

The heats of combustion per gramme-molecule of the alcohols are as follows:

				Diff.
Methyl Alcohol	CH_4O	169830	Cal.	154670
Ethyl “	C_2H_6O	324500	“	
Propyl “	C_3H_8O	480313	“	155813
Butyl “	$C_4H_{10}O$	636706	“	156393
Amyl “	$C_5H_{12}O$	793623	“	156917
Capryl “	$C_8H_{18}O$	1262100	“	156159×3
Cetyl “	$C_{16}H_{34}O$	2511282	“	156148×8

Mean of Differences 156097

This mean of differences is higher than the corresponding number for the fatty acids by 1822 cal.

Comparing the numbers for the alcohols with those of the corresponding acids, we have

				Diff.
Cetyl Alcohol	$C_{16}H_3O$	2511282	Cal.	137138
Palmitic Acid	$C_{16}H_{32}O_2$	2374144	“	
Capryl Alcohol	$C_8H_{18}O$	1262100	“	122185
Caprylic Acid	$C_8H_{16}O_2$	1139965	“	
Amyl Alcohol	$C_5H_{12}O$	793623	“	116947
Valeric Acid	$C_{15}H_{10}O_2$	676673	“	
Butyl Alcohol	$C_4H_{10}O$	636706	“	114028
Butyric Acid	$C_4H_{10}O_2$	522678	“	
Propyl Alcohol	C_3H_8O	480313	“	112368
Propionic Acid	$C_3H_6O_2$	367945	“	
Ethyl Alcohol	C_2H_6O	324500	“	111207
Acetic Acid	$C_2H_4O_2$	213293	“	
Methyl Alcohol	CH_4O	169830	“	110812
Formic Acid	CH_2O_2	59018	“	

When the number of carbon atoms in each of these substances is multiplied by the difference in value of the CH_2 group in the alcohol and acid series, and the product deducted from the above differences, a constant difference is obtained (107654) which enables one to calculate the heat of combustion of any fatty acid when that of the corresponding alcohol is known, and *vice versa*, as follows: Heat of combustion of acid $+107654+(n \times 1822)=$heat of combustion of alcohol, n being the number of CH_2 groups in the acid. Examples are given. (*Jour. prakt. Chem.* [2], **32**, *420.*) R. W. M.

Heat of Combustion of the Fatty Acids. F. STOHMAN and P. RODATZ.

The authors determined the heat of combustion of the silver salts, and from these calculated the numbers for the acids, and in several cases checked their results with determinations made directly on the acids.

The results of the experiments show that the heat of combustion of the fatty acids increases by 154275 for every increment of CH_2. (*Jour. prakt. Chem.* [2], **32**, *407.*) R. W. M.

On the Velocity of Saponification. L. TH. REICHER.

The author shows that the differences observed in the time of saponification when different bases are used is due not only to the nature of the base used but also to the ester saponified. (*Annalen*, **232**, *102.*) R. W. M.

Examination of Fatty Matters. By CH. DUBOIS and L. PADÉ.

Cacao Butter.—The fat was extracted in the laboratory from the seeds and was examined for the following points, viz., melting and solidification point; solidifying point of the fatty acids; solubility of the acids in absolute alcohol and estimation of the fatty acids.

The melting point was taken in the following manner: A beaker, (100 c. c.) two-thirds filled with mercury, is placed on a tripod in another beaker (500 c. c.) filled with water to nearly the surface of the mercury. In the mercury is placed the bulb of a thermometer graduated in tenths. The fat is melted and a drop placed on the mercury, where it extends and solidifies. The apparatus is heated and the fat carefully noticed. If the layer which it forms is sufficiently thin the fusion will be instantaneous, when the temperature indicated by the thermometer is noted and taken as the melting point. Cacao butter should not be examined until after remaining in a solid state for at least three days. It was found that a sample melted at 26°, after remaining solid an hour; at 27.4° after 24 hours; at 30.2° after 48 hours and at 32° after 72 hours, which point was the same after a month.

The following results were obtained :

Name of Sample.	Melting Point	Solidification Point.	Solidification Point of Fatty Acids	Per cent. of Fatty Acids.
Caracas (1)	32.0	29.0	48.6	94.71
Caracas (2)	32.2	28.6	48.6	94.47
Caracas (3)	32.0	28.7	48.4	95.40
Guayaquil	32.4	29.4	50.0	95.60
Para or Maraguan	32.4	29.2	49.4	95.89
Trinidad	32.4	29.8	48.9	94.71
Martinique	32.2	28.6	49.4	95.92
Bahia	32.0	28.8	48.2	95.22
Hayti	31.8	28.2	49.0	95.97
Nacaragua (Val Menier)	32.0	28.6	48.6	95.24
St. Thomas (Africa)	31.8	28.4	48.8	95.11
Maximum	32.4	29.8	50.0	95.97
Minimum	31.8	28.4	48.2	94.47
Mean	32.1	28.8	49.2	95.26

TABLE OF THE SOLUBILITY OF THE FATTY ACIDS IN 100 GRAMMES OF ABSOLUTE ALCOHOL.

	T. = 0°.	T. = 12°	T. = 22°
Caracas No. 1 Porto Cabello	2.32	5.67	21.6
Caracas No. 2 Rio de Chico	2.19	5.28	21.2
Caracas No. 3 Campano	2.30	5.67	21.4
Guayaquil	2.18	5.11	21.0
Para or Maraguan	2.20	5.25	20.8
Trinidad	2.28	5.37	21.5
Martinique	2.33	5.74	21.3
Bahia	2.34	5.79	21.7
Hayti	2.38	6.18	22.2
Nicaragua (Val Menier)	2.35	5.56	22.0
St. Thomas (Africa)	2.21	6.03	22.0
Maximum	2.38	6.18	22.2
Minimum	2.18	5.11	20.8
Mean	2.28	5.59	21.4

The density of cacao butter is 980 at 18°. (*Bul. Soc. Chim.*, 45, *161*, *6.*) R. W. M.

Apparatus for the Determination of the Fluidity of Mineral Oils. J. C. STAHL.

A Patented Process.—(D. R. P. Cl. 42, No. 34,163.) The fluidity of oils is estimated by noting the time taken by an air bubble to rise through the oil. A cylinder is provided with a well ground stopper between which and the surface of the oil, with which it is filled, there shall be an empty space of known volume. The cylinder is reversed and the time which the bubble take to rise to the top again is estimated. (*Ding. Pol. Jour.*, **259**, *270*.) R. W. M.

Action of Sulphuric on Oleic Acid. A. SABANEIEFF.

Pure oleic acid, prepared from almond oil, was cooled to 6°, when it became crystalline and was treated with sulphuric acid. The reaction was not violent and the evolution of sulphurous anhydride was rarely observed. The whole was then treated with water, when two layers formed, one consisting of dilute sulphuric acid and the other on solution in ether and washing with water yielded three portions, which were further examined.

The portion insoluble in water contains a solid which was found to be hydroxystearic acid, melting at 79°. This view was confirmed by the amount of iodine absorbed as estimated by Hübl's method. The same portion insoluble in water gave on treatment with alcohol a liquid residue which seemed to be the anhydride of the above acid. It does not combine with bases and could not be converted into the corresponding amide. The alcoholic extract from the above contains the anhydride, the acid and some unchanged oleic acid.

The portion of the product soluble in water was found to consist of sulphohydroxystearic acid, as shown by the analysis of the copper salt and by Hübl's method, and is easily decomposed by heating on the water bath with hydrochloric acid into hydroxystearic acid and sulphuric acid. The experiments show that 20% of the oleic acid is obtained in the form of the sulpho-acid, irrespective of the duration of the reaction; 7.5%–15% remains unchanged and 70% is converted into hydroxystearic acid and its anhydride. The author considers the action to be a series of simultaneous processes yielding the various substances described, a part of which are acted upon by water to form other substances. (*Jour. Russ. Chem. Soc.*, *1886*, **35 & 87**.) R. W. M.

Formation of Fat from Carbohydrates in Carnivora.

M. Rubner.

In order to show that, as in the case of herbivorous animals, the formation of fat from amyloid food takes place, a dog was fed on sugar and starch with a small quantity of fat after having been previously starved for a few days.

Analyses of the food and excrement showed that a large amount of carbon was retained in the body. This was more than that of the fat in the food, and it was proved that it was not assimilated in the form of glycogen nor did it remain undigested in the intestines. The conclusion was therefore drawn that it was stored up as fat. (*Zeit. Biol.*, **22**, *272.*) R. W. M.

Detection of Hydrocarbons in Fat and Oil. F. Nitsche.

Ten grammes of the substance are treated with 7 grms. aqueous soda (38° B.) and 30 grms. of alcohol; 40 grms. of glycerol are also added to prevent solidification of the soap. The hydrocarbons are then removed by extracting with 10 c. c. of benzine twice. The benzine is driven off and the hydrocarbons weighed and estimated. (*Chem. Centr'bl, 1885, 976.*) R. W. M.

Melting Point of Fats. C. Reinhardt.

The great discrepancies in the published data on this subject point to the methods used as the probable cause of error.

The author recommends a modification of Guichard's method. A tube is used of the same size and thickness as the bulb of the thermometer employed. Fat is drawn into this tube to the amount of the length of the thermometer bulb, and allowed to remain solid for some days. The tube is then connected with a vessel containing air under a definite pressure and heated in a vessel of water. The temperature is taken at the moment when the fat is driven out of the tube. The diameter of the tube and the air pressure affect the result. (*Zeit. Anal. Chem.*, **25**, *11.*) R. W. M.

Occurrence of Volatile Fatty Acids in Urine. R. v. Jaksch.

The amount found did not exceed 0.008 gm. per day. On oxidation the amount was raised to .9—1.5 gm. Under certain pathological conditions the quantity of free acid was increased but not that obtained by oxidation. In cases of fever and liver disease, from 0.6—1.0 gm. of free acid, mostly acetic, was found. (*Chem. Centr'bl, 1885, 905.*) R. W. M.

Examination of Mustard Oil. H. HAGER.

The artificial oil may be distinguished from the natural volatile oil by the fact that the natural oil gives a white or light gray turbidity or precipitate when mixed in alcoholic solution with mercuric nitrate, while the artificial oil under the same conditions gives a dark, gray precipitate. (*Chem. Centr'bl, 1885, 274.*) R. W. M.

Almond Oil Testing. G. VULPIUS.

The elaidin test was examined, using samples of genuine oil bought in the market, samples made from both bitter and sweet almonds in the laboratory and the same oils mixed with known quantities of olive oil. The test was applied in three ways—(a) 15 parts of the oil were shaken with 3 parts of fuming nitric acid and 2 parts of water ; (b) the same with the addition of a fragment of copper; (c) equal volumes of the oil and a mixture of 3 parts of fuming nitric acid and two parts of water.

The results were very variable and lead to the opinion that no reliable method can be founded on this test. (*Arch. de Pharm.*, [3], **24**, *59.*) R. W. M.

Simple Method for Detecting Adulterated Butter. A. MAYER.

This method is essentially and practically the same as that proposed by A. Wagner. (*Chem. Centr'bl, 1885, 412. This journal* VIII., **40** *Abstr.*) (*Bied Centr'bl, 1885, 851.*) R. W. M.

Oxidation of Sebacic Acid. H. CARETTE.

Sebacic acid, oxidized respectively by acid and neutral potassium permanganate and by nitric acid, gave in the three cases the same results, the products being succinic acid, adipic acid and the isopyrotartaric or normal propylenedicarboxylic acid described by Reboul. (*Comptes Rend.*, **101**, *1498.*) R. W. M.

Preparation of Soap from Suint and Fullers' Grease.

Suint will not serve alone for the preparation of soap but can be used in combination as follows :

	Parts.	Parts.
Rosin	600	500
Suint	1,500	1,500
Fullers' grease		500
Bone fat	1,500	1,000

The boiling is so managed that the bone fat and fullers' grease are first boiled with a lye of 12°-15°. The under lye is drawn off and the suint added to saponify 100 parts; 100 parts of a 22° lye are considered sufficient. Weaker lyes require stronger salting out and the removal of the under lyes which naturally makes the soap clearer. To make these soaps solid they must be evaporated for a long time. Strong lye is then added or some calcined soda.

The soaps are improved by the addition of some crude palm oil. The boiling is repeated with lyes not weaker than 16° B.; if weaker lyes are used the soap is only decolorized by an excess of lye and not by salting. The best plan is to boil the fullers' grease alone and then to add the rosin, of which not more than 15% should be used, after which the soap can be boiled down to the required consistence. (*Seifenfabrikant 1885, 542.*) R. W. M.

Abstracts of American Patents Relating to Chemistry.

(*From the Official Gazette of the U. S. Patent Office.*)

March 9th, 1886.

337,387.—Process of manufacturing ammonia. A. Feldmann.

After the crude ammoniacal liquor has been treated with lime, the solution is filtered instead of decanted, as is generally the case.

337,411.—Process of utilizing the waste heat from bone black revivifying kilns. S. M. Lillie.

337,448.—Manufacture of glucose. A. Seyberlich and A. Trampedach.

Starch is saccharified by dilute nitric acid.

337,490.—Composition to be added to starch to improve its quality. H. A. Gray.

Consists of sodium chloride and sodium biborate.

337,528.—Water proofing cloth. J. H. Sheldon.

The cloth is first saturated with a solution of gum arabic, salt and alum, and then with a solution of Spanish whiting and prepared chalk.

337,694.—Boiling fibers and sulphites for the manufacture of paper pulp. A. Mitscherlich.

March 16th, 1886.

337,900.—Process of separating sulphate of lime. T. G. Walker.

The solution is atomized by a jet of steam, to crystallize the calcium sulphate.

337,967.—Process of extracting gold and silver from ores and mattes. P. Manhes.

The pulverized material is chloridized by subjecting it to a low heat with ammonium chloride.

337,996.—Process of obtaining aluminium from aluminous ores and earths. F. J. Seymour.

The process consists in subjecting such ore or earth, with an ore of zinc, carbonaceous matter and a flux, to heat in a retort, whereby the oxides of aluminium and zinc are vaporized, and then subjecting the condensed product to heat with carbonaceous matter.

338,026.—Artificial stone. G. Blum.

Consists of slaked lime, sulphur, sulphuric acid, common salt or other saline matter, and sand.

338,060.—Artificial stone. J. Grant.

Consists of slag combined with hydraulic cement.

338,061.—Process of making fluorine salts. R. Graetzel.

March 30th, 1886.

338,723.—Process of manufacturing steel. E. F. Falcomet.

The molten metal, in a divided state—as in form of sheets or spray—is subjected to the combined action of currents of air and gas freighted with pulverized basic substances.

338,806.—Process of scouring wool. C. Toppan.

The wool is immersed in a warm solution of expressed oil of mustard seed, petroleum products and alkali.

338,924.—Manufacture of blocks of bicarbonate of soda. J. W. Carson.

The sodium bicarbonate is pressed into blocks immediately after being removed from the carbonating chambers or washing tables, whereby the addition of adhesive matter is rendered unnecessary.

338,989.—Apparatus for the manufacture of illuminating and heating gas. B. Loomis.

338,990.—Process of manufacturing gas. B. Loomis.

338,991.—Apparatus for manufacturing gas. B. Loomis.

338,992.—Process of and apparatus for making illuminating gas. B. Loomis.

339,067.—Process of reducing ores of nickel and cobalt with oxide of manganese. F. Lotter.

The pulverized ore and oxide of manganese are mixed together, and formed into blocks or cakes, these are surrounded by pulverized charcoal and heated to a temperature below the melting point of nickel or cobalt, until reduction takes place.

339,070.—Mixed paint. C. J. Mountford.

Consists of powdered asbestus, barytes, zinc oxide, and an alkaline silicate solution.

April 6th, 1886.

339,155.—Composition for blackboard walls. J. A. Ditch.

Consists of powdered slate, silicate and plaster of Paris.

339,168.—Coating for wire drawing.

Consists essentially of iron acetate.

339,177.—Natural gas carburetor. W. Herlehy, J. O. McGinnis and F. McGinnis.

339,201.—Apparatus for making extracts. J. Merz.

339,231.—Process of separating sugar from saccharine fluids. L. Sternberg.

The sugar is precipitated as calicum saccharate by first saturating the solution with lime, and then adding ammonium, sodium or potassium hydrate.

339,244.—Purifier of the water of steam boilers. E. W. Vanduzen.

339,331.—Process of treating ramie, or rhea, nettles, etc. T. E. Schiefner.

The broken and decorticated material is first subjected to the action of a bath of hydrochloric acid, and then washed with cold water. It is next placed in a bath of sodium carbonate or soda salt and spirits of turpentine, heated by steam. It is then washed with hot water, again treated with hydrochloric acid, and finally treated in a bath of neutral soap.

339,340.—Composition of matter for paving. P. C. Smith.

Consists of crushed stone, coal ashes, plumbago, soapstone, mica, asphalt and rosin.

339,360.—Basic lining for open hearth, steel and iron furnaces. W. F. Baths.

Consists of a lime lining, containing pieces of metallic iron or steel.

339,409.—Process of and apparatus for producing gas for lighting and heating purposes. F. Hember and E. Henry.

339,426.—Metal polishing composition.

Consists of tripoli, coal oil, camphor, spirits of ammonia, and spermaceti.

339,463.—Water proofing and preservation of fabrics. M. V. Piron.

The fabric is subjected to a hot bath of oil and an antiseptic substance, then dried and treated in a bath of oil, containing a non-metallic pigment and a waxy substance.

339,471.—Process of and apparatus for manufacturing gas. H. C. Rew.

339,472.—Process of and apparatus for manufacturing gas. H. C. Rew.

339,483.—Lubricating oil. J. Seeger.

Potash soap is dissolved in water containing alcohol. The solution is mixed with melted tallow, in which oil of turpentine and cod liver oil have been incorporated, and then rape seed oil is added.

339,493.—Manufacture of bleaching powder. E. Solvay.

Pulverized lime is placed on porous beds in a closed chamber, and chlorine gas is drawn or forced through.

339,519.—Composition of matter suitable for casting medallions, file, picture frames, moldings, etc. W. W. Barnes.

Consists of soluble glass, ground iron, ground flint, and roll sulphnr.

339,545.—Process of refining petroleum. J. B. Grant and A. Mason.

339,546.—Apparatus for refining oil. J. B. Grant and A. Mason.

339,552.—Apparatus for concentrating acids. J. Hughes.

339,569.—Composition for mable or stone. J. F. McCormic.

Consists of lime, marble dust or sand or analogous material, plaster of paris, cement, sulphur, and water with glue, molasses, etc. W. R.