

ABSTRACTS.

GENERAL AND INORGANIC CHEMISTRY.

Artificial Production of Spinel. STANISLAS MEUNIER.

Spinel is a magnesium aluminate, the pink coloration being due to traces of chromium. The author has obtained it by synthesis as follows: The bottom of a graphite crucible is covered with pure pulverized magnesia, pressed down; a mixture of aluminium chloride and of cryolite (double fluoride of sodium and aluminium) is then introduced, both chemicals being in fine powder, and the crucible is then filled with a mixture of alumina, magnesia, and traces of potassium bichromate. After heating five or six hours in a good coke fire, the crucible is left to cool slowly, and broken; in the melted mass the crystals of spinel are found with all the properties of the natural crystals.

By using the cryolite alone without aluminium chloride, pink scales of corindum are obtained without a trace of spinel, a fact which indicates either that the chlorine of the chloride liberates the fluorine of cryolite and enables this element to display its strong "mineral transforming properties" (*proprietes minéralisatrices*) as Prof. Fremy has demonstrated, or else that the alumina of the chloride contains special combining energies. (*Arch. de Pharm.*, 2, 443.)
M. L.

Analysis of Acid Water from Lake Hope. R. W. EMERSON MACIVOR.

Lake Hope is on White Island, New Zealand, and occupies the crater of a submerged volcano.

At the time of taking the sample the temperature of the water was 68° C.

Stated in parts per thousand, it contained :

Ferrous sulphate.....	15.254
Aluminium ".....	1.350
Calcium ".....	3.605
Magnesium ".....	0.931
Potassium ".....	4.715
Sodium ".....	10.033
Aluminium chloride.....	25.557
Sodium ".....	11.950
Silica.....	0.670
Hydrochloric acid.....	149.876
Water, etc.....	776.059
	1000.000

The probability is that the sulphur, which abounds on the island, and the hydrochloric acid in the lake, result from the action of sea water on hot beds of pyrites within the center of the submerged mountain. (*Chem. News*, **56**, 251.) W. P. M.

On the Oxidation of Silver. H. LE CHATELIER.

The author has succeeded in oxidizing silver directly. Basing himself on the laws of dissociation, the temperature of dissociation of silver oxide under atmospheric pressure is calculated to be 327° : the temperature of oxidation should then be in the neighborhood of this temperature of dissociation, or higher. But it is known by experiment that silver oxide is decomposed at 250° , consequently it was probable that the oxidation only took place at a higher temperature, 300° for instance. The author succeeds in oxidizing silver at 300° by heating the metal in a glass tube, oxygen being supplied by potassium permanganate. The oxidation takes place under 15° atmospheric pressure, but the proportion oxidized never exceeds 50%. The author concludes that all other so called inoxidable metals can be directly oxidized under certain conditions of temperature and pressure. (*Bull. Soc. Chim.*, **48**, 343.)

M. L.

Alumina as a Natural Constituent of Wheat Flour.

W. C. YOUNG.

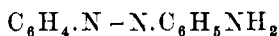
Confirmatory of a previous paper by the author, and also of a recent one by Yoshida, in which it is shown that alumina is a

normal constituent of wheat and other cereals. The great bulk of the alumina is confined to the gluten, the starch being nearly free from it. (*Analyst*, **13**, 5.) W. P. M.

ORGANIC CHEMISTRY.

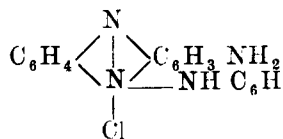
Researches on Pheno-Safranine. PH. BARBIER and LEO VIGNON.

The authors have in view the study of the constitution of safranines, and take first the simplest of them, pheno-safranine. Safranines are produced by condensation of a molecule of *para*-diamine and 2 molecules of an aromatic monamine, with eliminations of $4H_2$ under the influence of oxidizing agents. The authors in considering the conditions of formation of safranine have isolated and studied the intermediate products of formation. The oxidation at low temperature of a mixture of paraphenylene diamine (1 mol.) and 1 mol. of aniline, gives at first a blue compound, which after washing and filtration is transformed—slowly at ordinary temperature, immediately at 100° —into pheno-safranine, as the analysis shows. With 2 molecules of aniline the yield is much higher, without formation of any other product. The blue compound in the presence of zinc and HCl is broken up into aniline and a leuco-base, which the authors regard as an amido-phenazine

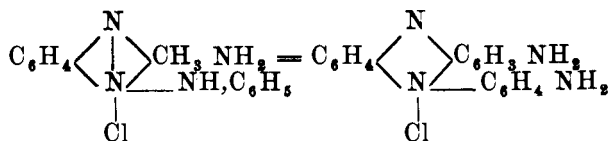


The authors represent the formation of pheno-safranine by the following series of reaction :

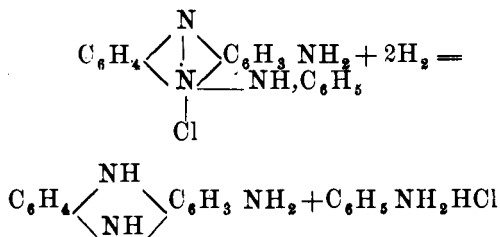
1st. Formation of the blue compound.



2d. Transformation of the blue compound into safranin.



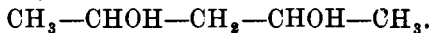
3d. Decomposition of the blue compound by hydrogen.



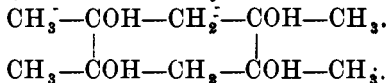
By oxidation in contact with air the leuco-base given by the third formula is converted into amido-phenazine. (*Bul. Soc. Chim.*, 48, 339.) M. L.

Derivatives of Acetylacetone—Synthesis of Polyatomic Alcohols. ALPH. COMBES.

Some reactions of acetylacetone, which has previously been described, are given. Sodium amalgam converts this body into isopropyl alcohol and pinacone, products similar to those obtained with the ordinary acetone. The hydrogenation in an acid solution gives entirely different results, but the operation is very slow. The liquid obtained distills at 177° and has the composition C₆H₁₂O₂, answering to the composition of the symmetrical bissecondary normal amylic glycol,



The body remaining above 177° is not pinacone, as the author was led to think, but it is an anhydride of the tetratomic alcohol,



Hydriodic acid transforms the acetylacetone into pentane; the author obtained, in addition to the iodides of normal secondary

amylic alcohol, a symmetrical bissecondary normal amylic glycol. He describes the action of the chlorine and bromine on acetyl-acetone. Ammonia gas gives an addition-product.



of unstable nature, and converted at 25°-30° into acetamide and acetone. (*Bul. Soc. Chim.*, **48**, 475.) M. L.

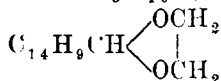
Combination of Glycol with Aldehydes. H. LOCHERT.

The author has combined cœnanthol with glycol and obtained the oxide of ethylene-cœnanthylidene $\text{C}_8\text{H}_{13}\text{CH}$ $\begin{matrix} \diagup \text{OCH}_2 \\ | \\ \diagdown \text{OCH}_2 \end{matrix}$

1st. By direct combination of glycol and cœnanthol in a sealed tube at 125-130°.

2d. By direct combination in the presence of glacial acetic acid.

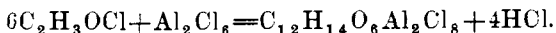
He has obtained in the same way the combination of glycol and valeral $\text{C}_5\text{H}_{10}\text{O}$; the product boils at 142°, and has the formula



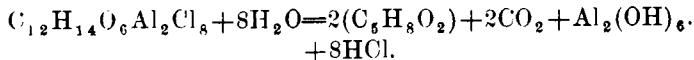
The author has begun the study of the combination of glycol with isobutylic aldehyde. (*Bul. Soc. Chim.*, **48**, 338.) M. L.

New Reaction of Aluminium Chloride—Synthesis in the Fatty Series. ALPH. COMBES.

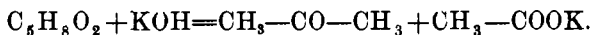
When aluminium chloride is thrown into acetyl chloride kept on the water bath at 40-50°, a strong reaction takes place; to facilitate it is better to dissolve the acetyl chloride in chloroform. The crystalline body formed has the composition $\text{C}_{12}\text{H}_{14}\text{O}_6\text{Al}_2\text{Cl}_8$, showing that 6 molecules of the organic chloride enter into reaction with 1 molecule of aluminium chloride.



This organo-metallic compound is decomposed by water, and the result of the decomposition is a body of the formula $\text{C}_5\text{H}_8\text{O}_2$, with formation of CO_2 and HCl .



This new body is not changed by phosphorus trichloride or by acetyl chloride, and is converted by caustic potash into potassium acetate and acetone.



The author assigns then, to the new body, the molecular arrangement



and calls it acetyl-acetone. He discusses its probable formation, and gives its properties and reactions. (*Bul. Soc. Chim.*, **48**, 465.) M. L.

On Aniline Bichromate. CH. GIRARD AND L'HOTE.

This salt cannot be prepared directly by the action of chromic acid on aniline, on account of the oxidation which occurs. To prepare it by double decomposition, saturated solution of aniline chlorhydrate and a soluble bichromate are mixed; the yellow crystals found are washed with water and dried. The authors have found the resulting body to have the composition $C_{12}H_4(NH_3)_2CrO_3$.

It is sparingly soluble in cold water, and decomposed by boiling water; soluble in alcohol, which it slowly transforms into aldehyde. It is combustible, and is exploded by a shock. Treated with hot water it is transformed into violet coloring matters similar to mauveine (Perkin's violet). By its action upon aniline in excess of aniline chlorhydrate, products similar to violaniline and induline are obtained. (*Arch. de Pharm.*, **2**, 441.) M. L.

On the Volatile Acids of Suint. A. BUISINE.

The author has succeeded in separating or determining all of the volatile fatty acids contained in the wash water of wool (suint waters) after their fermentation. He transforms those acids into their ethylic ethers, which are then separated by distillation. The acids are found in the following proportion :

Formic acid	.....	traces.
Acetic	.....	60 %
Propionic	.....	25 "
Butyric	.....	5 "
Valerianic	.....	4 "
Caproic	.....	3 "
Caprylic	.....	traces.
Benzoic	.....	3 %
Phenol	.....	traces.

 100

The phenol was detected by adding bromine water to the liquid distilled, and collecting the tribromphenol. The author indicates in a note that the amount of pure acetic acid that could be extracted from the wool worked in Northern France would amount to 1,000,000 kilogrammes. He adds that each cubic meter of suint water would yield 5 or 6 kilogrammes of propionic acid. (*Bul. Soc. Chim.*, 48, 639.) M. L.

ANALYTICAL CHEMISTRY.

Detection of Nitrates in Potassium Chlorate. ARMAND JORISSEN.

The method proposed by the author rests upon the transformation of nitric acid into nitrous acid by nascent hydrogen in and by the use of Griess' reagent, metadiamidobenzol chlorhydrate.

The operation consists in taking a few grammes of the chlorate, shaking in a tube with 10 c. c. of distilled water, decanting after a few minutes and adding 3 drops of strong acetic acid and a fragment of pure, distilled zinc, and after standing 5 or 10 seconds, removing the zinc and add the reagent. On shaking, a yellow coloration appears if a nitrate is present, the color becoming more and more intense and turning brown if there is as much as 1% of nitrate in the chlorate. (*Arch. de Pharm.*, 2, 395.) M. L.

Determination of Phosphoric Acid in Contaminated Waters. T. L. PHIPSON.

To about a pint of the water a very small quantity of solution of pure potash alum is added, and then a drop or two of ammonia.

Without separating the precipitate, the water is rendered distinctly acid by addition of pure acetic acid; the phosphate of alumina remaining is separated, dissolved in nitric acid, and the phosphoric acid determined by the ordinary molybdate method. (*Chem. News*, 56, 251.) W. P. M.

Apparatus for Preparing Sulphurous, Carbonic, and Phosphoric Anhydrides. WARREN.

Into a large Wolff bottle a small dish is introduced. Sulphur in lumps is placed in the dish through a tube passing through the central tubulure. After igniting the sulphur with a red hot wire, the central orifice is closed by a stopper. Air is supplied from a bellows, through one of the side openings, and the resulting sulphur dioxide escapes by the other. Several gallons of water may be saturated in a short time. Carbonic or phosphoric anhydrides may be similarly prepared. (*Chem. News*, 56, 245.) W. P. M.

New Method of Folding Filter Papers. O. HEHNER and H. D. RICHMOND.

Fold the paper across the center as usual, open it, and fold it again at right angles; press the parts between the diameters thus indicated inward to the middle; the paper when looked at from the top now forms a four-pointed star. Press it flat; the outer edges now meet at an angle of 90°. Double back each pair of edges, so that they meet in the middle, and open the filter for use. From actual experiment it is claimed that this manner of folding will filter in one-fifth the time usually occupied by the ordinary fold. Precipitates are said to be more easily washed on this than on the "plaited" filter. (*Analyst*, 13, 2.) W. P. M.

Substitution of Asbestos Cloth for Blotting Paper in Milk Analysis. W. JOHNSTONE.

The advantages are that, after having been thoroughly ignited, the operator has a material of great porosity, which is absolutely insoluble in ether, and therefore can yield no ethereal extract; and also that the coils can be used an indefinite number of times; the milk residue is simply burned off, and they are again ready for use. (*Analyst*, 12, 234.) W. P. M.

Does Neutral or Sub-acetate of Lead Precipitate Hop Bitters? W. JOHNSTONE.

The bitter taste of the chloroform or ether residue, after precipitating the hop bitters from the beer by the use of sub-acetate of lead, was formerly considered evidence of the presence of "hop substitutes." This test is shown to be untrustworthy, as the said bitter taste was obtained when experimenting with hops known to be unsophisticated. Similar results were obtained by Dr. Muter. (*Analyst*, **13**, 6.)

W. P. M.

Action of Oils on Polarized Light. M. PETER.

The conclusion of this paper is that the polarimetric process is invaluable for the detection of mixtures of oils, and especially for olive oil; this process has been employed for three days at the Municipal Laboratory of St. Etienne (France). The author insists on the fact that the fatty acids have the same rotary power as the oils they are derived from, and consequently that it is easy to detect of what oil, for instance, a soap has been made. A similar work of M. Bishop is published in the *Journal de Pharmacie et de Chimie*, and the results are comparable with those of M. Peters. (*Bul. Soc. Chim.*, **48**, 483.)

M. L.

On a New Method of Separation of the Alkaloids of Opium. P. C. PLUGGE.

Mix the solution containing the alkaloids as chlorides with a sufficient quantity of sodium acetate and let stand for 24 hours. At the expiration of this time, filter and wash the precipitate with cold water: the precipitate contains the narcotine and the papaverine. The other alkaloids remain in solution.

Redissolve the precipitate in HCl, and dilute so as to contain less than $\frac{1}{400}$ of narcotine; mix the solution with potassium ferricyanide, filter after 24 hours; the narcotine remains in solution from which NH_3 will precipitate it. The papaverine ferricyanide is treated with dilute NaHO, washed, dissolved in HCl, and precipitated by NH_3 . The solution of narceine, codeine, thebaine and morphine in sodium acetate is concentrated, and left for 24 hours; narceine precipitates. The filtered liquid is treated with sodium salicylate and left for 24 hours; codeine and morphine remain in

solution; thebaine precipitates as a salicylate, which is washed on the filter till no coloration is given with ferric chloride; the residue is pure thebaine. The salicylic solution is acidulated with HCl, filtered and treated with chloroform to remove the salicylic acid, and the remaining traces of narceine and thebaine. Neutralize exactly and add potassium sulphocyanate, which precipitates the codeine; the solution contains the morphine which may be precipitated by NH_3 . (*Bul. Soc. Chim.*, **48**, 604.) M. L.

On the Value of Baudouin's Reagent to Detect Sesame Oil. M. MERKLING.

The reaction of Baudouin consists in agitating 2 c.c. of the oil with 1 c.c. of HCl (1.18°) containing about 0.05 or 0.10 gm. of pure cane sugar. If the oil contains sesame oil it will turn pink.

By agitating sesame oil with glacial acetic acid the author has isolated a resinous body which gives the red coloration with the reagent, whereas the oil from which it has been separated does not give the coloration. This reaction is peculiar to sesame oil. It must be observed that the reagent itself is not permanent, turning yellow and then brown after a few minutes.* (*Arch. de Pharm.*, **2**, 440.) M. L.

A Reaction of Narceine. P. C. PLUGGE.

If a small quantity of narceine be heated with dilute H_2SO_4 nothing appears; but if the mixture is heated on the water bath a violet coloration, soon passing to cherry red, appears at a certain concentration of the solution. If the red solution is cooled, and if a trace of nitric acid or potassium nitrate be added, blue streaks appear in the red solution. This is characteristic of narceine. The sensibility is such that it allows the detection of 0.000015 gm. of the base. (*Arch. de Pharm.*, **25**, 425.) M. L.

* Mr. Terreil uses the reaction simply by mixing the HCl and the oil, and dropping a grain of sugar into the mixture. M. L.

Abstracts of American Patents Relating to Chemistry.

(From the Official Bulletin of the U. S. Patent Office.)

September 6th, 1887.

369,861.—Process of reducing and melting magnetic oxide of iron. W. E. Norris.

369,885.—Paint and paint compounds. G. W. Banker.
Consists of corn oil, a dryer and a pigment.

September 20th, 1887.

370,220.—Process of extracting aluminium. O. M. Thowless.
Aluminium chloride is mixed with sodium-producing substances and heated, after which the product is ground and washed.

370,273.—Gas producer. W. L. McNair.

370,358.—Process of treating natural gas. T. G. Springer.

September 27th, 1887.

370,383.—Indelible ink. C. P. Dimitry.
Consists of water, gelatine, potassium bichromate, diamond slate dye, creosote and india ink, the whole to be shaken well together and exposed to sun light.

370,511.—Obtaining ferric oxide from the waste liquors of copper works. G. L. Wigg, M. Steele and J. Wigg.

370,545.—Water proofing compound. F. Kreutzer.
Consists of raw linseed oil, zinc sulphate and fat soap.

October 4th, 1887.

370,768.—Process of and apparatus for the manufacture of gas. S. R. Dickson.

370,936.—Carburetted apparatus. T. Drake.

370,950.—Desulphurizing and purifying petroleum oils. D. M. Kennedy.
The oil is mixed and heated with a solution of copper sulphate, sodium hydroxide and sodium chloride.

370,957.—Apparatus for manufacturing gas. A. B. Lipsey.

370,971.—Manufacture of water gas. J. M. Rose.

370,972.—Manufacture of water gas. J. M. Rose.

370,973.—Manufacture of water gas. J. M. Rose.

371,021.—Solvent for pyroxiline. O. P. Amend.

Consists of a mixture of the acetate, chloride and chloracetates of amyl.

371,074.—Disinfectant. C. T. Kingzett.

Consists of spirit or oil of turpentine oxidized in presence of sea water (natural or artificial).

371,093.—Process of making soap. M. O'Hara.

The oil is first emulsified by agitating with salt water and then saponified.

371,127.—Process of recovering glycerin from soap lyes. A. Domeyer and O. C. Hagemann.

The process consists in first adding lime; second, boiling the lye down to the salting point; third, adding acid in presence of an insoluble powder constituting a mechanical carrier of the resulting precipitate, then adding alkali and, finally, boiling down the lye until the salt it contains crystallizes and glycerin is separated.

October 11th, 1887.

371,186.—Process of and apparatus for making ammonium sulphate, T. B. Fogarty.

The process consists in, first, injecting air alone, or air and steam mixed, into and through an incandescent carbonaceous fuel contained in a furnace, causing the oxygen to combine with the carbon of the fuel and to produce oxides of carbon, free hydrogen and nitrogen gas; second, causing the crude nitrogenous gas so produced to mix with suitably adjusted volumes of steam and air, and the mixed volume of gas, steam and air to meet with a moving or falling volume of pulverized carbon and alkali and the nitrogen of the gaseous mixture to combine with such carbon and alkali, producing cyanogen and alkaline cyanides, which in turn are decomposed by the steam present, producing ammonia, hydrogen gas, and oxides of carbon; third, combining the ammonia and carbon dioxide in the gases resulting from the second sub-process with the gypsum, producing ammonium sulphate and calcium carbonate.

371,187.—Process of and apparatus for making ammonia. T. B. Fogarty.

371,233.—Refractory lining for metallurgical furnaces. T. Twynam.

Consists of chrome ore and an alkali or alkaline earth.

371,248.—Process of coating iron with tin or its alloys or other metals. E. I. Braddock.

The iron is first coated with iron by electro deposition, and then with zinc or other metal by immersing in the molten metal.

371,376.—Explosive. H. Schoeneweg.

Consists of nitrated hydrocarbons, and nitrated cellulose with an oxalate or oxalic acid.

371,406.—Plastic composition for insulating electric wires, etc. W. W. Barnes.

Mineral coal and sulphur are fused together.

371,528.—Manufacture of sugar. M. Swenson.

A carbonate of alkaline earths is added to the diffusion bath to prevent the invertive action of the organic acids upon the sugar during the extraction of the cane chips.

W. R.