

## ABSTRACTS.

## GENERAL AND INORGANIC CHEMISTRY.

**Researches on Antimony Sulphide.** BERTHELOT.

The conclusions of the author are :

1. Inverted actions are produced where the sign of the heat given out by the reaction of antimony sulphide and HCl is changed by the combination of one of them with a third body, as, for example, with water forming hydrates, or even with one of the products of the reaction.

2. The chemical action is not suddenly reversed, but follows a certain gradation of intermediate products, such as hydrates, sulphydrates, chlorhydrates, oxychlorides and chlorosulphides, the heat of formation of which tends to fill up the interval of the principal thermic reactions.

3. These intermediate compounds exist generally in a partially dissociated condition.

4. It is by these compounds that the chemical equilibrium between antagonistic bodies is determined and regulated. Thus is established the fundamental distinction between the reactions belonging to the internal energy of the systems, the gradual disappearance of which follows the principle of maximum work, and the effects due to foreign energies, as calorific energy, for instance, which acts especially to produce changes of state and dissociation. (*Bul. Soc. Chim.*, 47, 44.) M. L.

## ORGANIC CHEMISTRY.

### Chemical Composition of Butyrellite. W. J. MACADAM.

Ten samples of this substance yielded, in all cases, ethereal extracts similar to those obtained from butter. This portion varies from 91.52–98.94% ; the portion insoluble in ether (0.38–4.56%) was soluble to a small extent in water and gave evidence of the presence of milk sugar. The portion insoluble in water contained nitrogen, and when burned gave the odor of burning cheese. The ash gave a reaction for phosphoric acid. These facts, together with the presence of cows' hairs, show that the substance is of animal origin and has no claim to be called a mineral. (*Min. Mag.*, **6**, 175.)

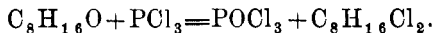
R. W. M.

### Pure Butyric Acid. A. BANNOW.

This acid is best prepared by converting the commercial acid into the ethyl salt and reconverting the fraction boiling at 120–121°, into the acid. (*Ber. d. ch. Ges.*, **19**, 2552.) R. W. M.

### Caprylidene, an Acetylene Hydrocarbon. A. BEHAL.

Caprylic aldehyde is prepared by dry distillation of castor oil soap. The aldehyde treated by phosphorus perchloride gives octylene chloride.



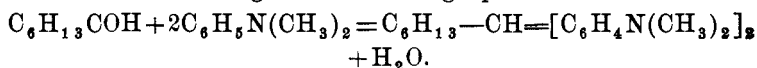
The product of the reaction is boiled for 72 hours in a retort with reflux. The body  $\text{C}_8\text{H}_{16}\text{Cl}$  obtained is heated in a sealed tube with alcoholic potash at 150° for 12 hours. The product of the operation is rectified; it is caprylidene. This hydrocarbon is hydrated by solution in  $\text{H}_2\text{SO}_4$ , cooled by ice, and is treated with water. The resulting body, which distils at 167°–173°, is an acetone of the formula  $\text{C}_8\text{H}_{16}\text{O}$ ; it is a colorless liquid, of an apple-like odor; Sp. gr. .8351. It does not reduce silver nitrate nor Fehling's solution; combines with sodium bisulphite. By oxydation with bichromate and  $\text{H}_2\text{SO}_4$  it gives caproic and acetic acids. The conclusion of the author is that caprylic aldehyde has physical properties identical with

methylhexylacetone, obtained by him synthetically, but their products of oxidation as well as their reducing properties are different. (*Bul. Soc. Chim.*, 47, 33.) M. L.

**Action of Cœnanthol and of Chloride of Cœnanthyl on Dimethylaniline in Presence of Zinc Chloride.** V. AUGER.

The conclusions of this lengthy paper are :

1. Cœnanthol combines with dimethylaniline in presence of zinc chloride according to the following equations :



The base obtained is easily decomposed by the oxydizing agents with separation of the heptyl groups.

2. Chloride of cœnanthyl combines with dimethylaniline according to two equations ; one giving a leuco base of the formula  $\text{C}_{23}\text{H}_{32}\text{N}_2$ , the other an acetone  $\text{C}_6\text{H}_{13}\text{CO}-\text{C}_6\text{H}_4\text{N}(\text{CH}_3)_2$ . (*Bul. Soc. Chim.*, 47, 42). M. L.

**Relations Between the Formation of Oxalic Acid in Plants and of Albuminoid Matter.** BERTHELOT and ANDRÉ.

The authors have determined nitrogen and oxalic acid in the leaves of *Rumex acetosa*, and found them extremely rich in albuminoids. Oxalic acid comes from an incomplete reduction of  $\text{CO}_2$  by the plant forming the group  $\text{CHOC}_2\text{O}_4 + \text{H}_2\text{O}_2 = \text{C}_2\text{H}_2\text{O}_2 + \text{O}_4$  ( $\text{O} = 8$ ). The formation of oxalic acid from this body  $\text{C}_2\text{H}_2\text{O}_2$  requires a substance richer in H than the carbohydrates  $2\text{C}_2\text{H}_2\text{O}_2 + 2\text{H}_2\text{O}_2 = \text{C}_4\text{H}_2\text{O}_8 + \text{H}_2$ , and this hydrogen, according to the authors must come from the albuminoids. (*Bul. Soc. Chim.*, 47, 29.) M. L.

## ANALYTICAL CHEMISTRY.

### Determination of Phosphorus in Iron and Steel. E. F. WOOD.

#### METHOD A.

*For Iron, Steel and Ferro-Manganese.*—To 1.63 grm. of the sample, in a porcelain dish No. 4, add 35 c. c. nitric acid, Sp. gr. 1.2, dissolve, evaporate almost to dryness over a flame, add 15–20 c. c. conc. HCl, again evaporate and heat for about 1 hour at a temperature of 300° C., until all HCl is expelled; allow to cool, add 30–35 c. c. conc. HCl, boil until all but silica and graphite has dissolved, dilute with a little hot water, filter into beaker of 200 c. c. capacity, wash with hydrochloric acid and water so that filtrate and washings do not exceed 125 c. c. Evaporate the sol. to 15 c. c., add 35–40 c. c. HNO<sub>3</sub>, Sp. gr. 1.42, again evaporate to 15 c. c., add 5 c. c. water, cool, add 70 c. c. molyb. sol., stir well and then let stand for 2 hours at 20°–40° C. until precipitation is complete, and the supernatant liquid is entirely clear. Remove the liquid with a pipette and transfer the precip. into a tared filter, of 6–7 cm. diam. (which has been dried at 100° C. to constant weight) by rinsing with water containing 2% of nitric acid of 1.2 Sp. gr. Wash the precip. 4–6 times with the nitric acid dilute sol., then dry at 100° C. and weigh. The precip. ammonium phosphomolybdate contains 1.63% phosphorus.

#### METHOD B.

*Suitable for Steel and Wrought Iron.*—To 1.63 g. of the sample in beaker of 200 c. c. capacity add 35 c. c. nitric acid of 1.2 Sp. gr. After the violent reaction has ceased, heat over a flame and boil until sol. has been concentrated to 15 c. c.; add 15–18 c. c. chromic acid solution, boil and concentrate to 15–20 c. c. (x), add 5 c. c. water, cool, precip. and weigh, etc., as in A. For more rapid work the last chromic acid solution (x) is rinsed into an Erlenmeyer flask by use of about 8 c. c. water, and precip. at 40° C. with 70 c. c. of molyb. sol. also warmed to 40° C. The flask and contents are well agitated during 5 minutes, and then allowed to stand 10 minutes. Filter, wash, dry at 135° C., and weigh.

## METHOD C.

Dissolve 1.63 g. of sample in 35 c. c. nitric acid as in B., boil 3 or 4 min., add 3-5 drops hydrofluoric acid, concentrate to 15-20 c. c., add 18 c. c. chromic acid sol., boil 5 min., filter through asbestos filter, wash with hot water, concentrate filtrate and washings to 20 c. c.; cool and precip. as before.

## REAGENTS REQUIRED.

Molybdenum Sol.—To a mixture of 1,200 c. c. water and 700 c. c. conc. ammonia (88 to 90 Sp. gr.), add 454 g. of molybdic acid; dissolve, add gradually 400 c. c. nitric acid of 1.42 Sp. gr. Of this sol. pour 600 c. c. into a mixture of 615 c. c. nitric acid of 1.42 Sp. gr. and 715 c. c. water; let stand 24 hrs. and filter before using.

Chromic Acid Solution.—Dissolve about 50 g. chrom. acid in 1 litre  $\text{HNO}_3$ , Sp. gr. 1.42. The solution loses its oxidizing power if kept over 3 or 4 weeks.

Asbestos Filters.—On a small quantity of glass wool contained in a thistle funnel tube, place 1-2 gm. of dry asbestos fibres, over which pour a cream of asbestos (prepared by rubbing up asbestos fibres in water) and wash until the water runs through clear. (*Fres. Zeit.*, 25, 489.)

J. F. G.

**Separation of Zinc from Iron, Cobalt and Nickel. P. VON BERG.**

It was found that the most satisfactory separation of zinc from the above bases could be accomplished under the following conditions:

1. *From Formic Acid Solutions.*—Dilute the solution to be precipitated so that the proportion of  $\text{ZnO}$  to the volume of liquid bears about the relative proportion of 1 gm.  $\text{ZnO}$  to 1,000-1,200 c. c. Then add 1% of the volume of the solution of formic acid of 1.2 Sp. gr., also a slight excess of sodium formiate (sufficient to combine with the mineral acids displaced from the bases during precipitation) and precipitate at 50°-60° C. with a stream of  $\text{H}_2\text{S}$  gas. Filter immediately after complete precipitation. When cobalt is present it is advisable to dissolve the washed precipitate,

and reprecipitate under above conditions. Still better results are obtained by precipitation.

2. *From Monochloroacetic Acid Solutions.*—Dilute the solution so that the relative proportion of ZnO to the volume of liquid shall be about 1 grm. ZnO in 1,400 c.c. Warm the solution to 50°–60° C., add for every 450 c.c. of solution 4 c.c. of dilute ammonia (34 grms.  $\text{NH}_3$  per liter) and 7 c.c. of monochloroacetic acid (378 grms.  $\text{CH}_2\text{ClCOOH}$  per liter) and precipitate with  $\text{H}_2\text{S}$  gas. Filter immediately after completion of precipitate. (*Fres. Zeit.*, **25**, 512.) J. F. G.

### **Direct Separation of Manganese from Iron.** L. BLUM.

The manganese is completely precipitated as manganic ferrocyanide by potassium ferrocyanide in an ammoniacal solution containing sufficient tartaric acid to prevent the precipitation of either the iron (previously oxidized to ferric salt) or manganese on the addition of ammonia. The reaction is quite delicate, as the precipitate can be obtained from solutions containing only 0.00004 g. manganese in the presence of 0.01 g. ferric chloride. The precipitate is best obtained in a boiling solution. The above method of precipitation can be applied in special cases only, as the precipitate cannot be retained on the filter when washed with water. (*Fres. Zeit.*, **25**, 519.) J. F. G.

### **A New Method for the Volumetric Determination of Fluorine.** DR. FELIX OETTEL.

This method depends upon the evolution of silicon fluoride by treating the sample with a specially prepared, concentrated sulphuric acid in the presence of quartz, and measuring the volume of gas evolved by displacement similar to the determination of carbonic acid by Scheibler's apparatus. For details and apparatus see the original article. The process is comparatively rapid and accurate in its results. (*Fres. Zeit.*, **25**, 505.) J. F. G.

### **To Cut Glass Tubing, etc.** ERNST BÜCKMAN.

Scratch the tube with a file, and on both sides of the mark wind two moist rolls of paper in parallel position around the tube.

Apply a small flame between the paper rolls, which causes the glass to crack, beginning at the file mark and extends around the tube midway between the paper rolls. (*Fres. Zeit.*, **25**, 530.)

J. F. G.

### **Separation of Antimony and Tin.** A. CARNOT.

Add ammonia or  $\text{NH}_4\text{Cl}$  to the solution of tin and antimony in hydrochloric acid with ammonia, then about 2 grms. of oxalic acid solution, and finally ammonia to saturation. Dilute to 250–300 c.c. and add a sol. of sodium hyposulphite (10 parts hypo. for 1 part of the solution). Heat and then treat with 1 or 2 c.c. of dilute  $\text{HCl}$ , and boil for a few minutes; add a few drops  $\text{HCl}$ ; if the solution remains clear add hyposulphite; if it becomes milky the metal is entirely precipitated. If it takes a yellow or reddish color, acid must be added and sometimes hyposulphite also. The antimony sulphide is collected. The solution contains all of the tin. It is treated by  $\text{NH}_3$ , then by  $(\text{NH}_4)_2\text{S}$ , which is decomposed afterwards by an acid. The tin sulphide is ignited and converted into oxide. (*Bul. Soc. Chim.*, **47**, 51.)

M. L.

### **Separation of Arsenic, Antimony and Tin.** A. CARNOT.

The mixture or alloy of metals or sulphides is dissolved in aqua regia, and  $\text{Sb}$  is precipitated as oxysulphide, the precipitation of  $\text{As}$  and  $\text{Sn}$  being prevented by addition of oxalic acid and sulphurous acid.

The solution separated from  $\text{Sb}$  is boiled in presence of a large excess of  $\text{HCl}$ , and  $\text{H}_2\text{S}$  is passed into the boiling solution. If only a small amount of  $\text{As}$  is present the precipitation is almost immediate.  $\text{As}_2\text{S}_3$  is collected, oxidized and determined by conversion into ammonio-magnesian arseniate or by Marsh's apparatus. The  $\text{Sn}$  remaining in solution is precipitated as sulphide and treated in the usual way. (*Bul. Soc. Chim.*, **47**, 55.)

M. L.

### **Determination of Boric Acid.** T. ROSENBLADT.

This process depends upon the volatilization of boric acid as methyl borate, an ether which is very volatile, its boiling point being  $65^\circ\text{C}$ . For quantitative determination a suitable quantity of the finely pulverized material is placed in a 100 c.c. flask, which

is connected with a second flask by means of a condenser. The second flask is protected by a third flask containing a dilute solution of ammonium carbonate. Moisten the powder in the first flask with a few drops of methyl alcohol, close the apparatus, and through a glass stoppered funnel tube introduce into the flask at least two parts of conc.  $H_2SO_4$  for one part of material taken for the determination, and follow this with 10 c.c. of methyl alcohol. Distil by heating on a water-bath. Continue the distillation with successive portions of 5 c.c. methyl alcohol, of which 40-50 c.c. are sufficient to completely volatilize 0.39 grm. boracic acid. The distillate in the receiver (flask 2), and contents of the small flask (3), protecting the same are mixed, the connecting tubes also rinsed and washings added to distillate, to which 10 c.c. of ammon. carbonate sol. (1:10) is then added, and the whole carefully evaporated with a known amount of freshly ignited  $MgO$ . The dry residue is then ignited, the increase in weight being considered as due to boracic acid.

Substances containing fluorine must first be strongly ignited. The volatilization of  $Cl$  is obviated by placing silver sulphate in the distilling flask. Substances insoluble in acid are first decomposed by fusion with sodium potassium carbonate. The methyl alcohol must be pure, and when mixed with sulphuric acid and heated on the water bath, should not become discolored or develop sulphur dioxide acid. (*Fres. Zeit.*, **25**, 18-23). J. F. G.

### **Separation of Mercury and Palladium from each other, and from Lead, Copper and Bismuth.** TH. ROSENBLADT.

The sulphides of cobalt, nickel, mercury and palladium are easily soluble in solutions of potassium thiocarbonate. From such a solution, containing the sulphides of mercury and palladium, carbonic acid completely precipitates the mercury as sulphide, leaving the palladium in solution. The thiocarbonate solution may be prepared by dissolving 1 part of sulphur in 2 parts of carbon disulphide. This should then be digested for several days in 15 parts of  $KOH$  solution of 1.13 Sp. gr. The orange colored solution is then poured off, and the residue again treated with 8 parts of  $KOH$  solution. If the  $CS_2$  solution becomes colorless more sulphur must be dissolved in the same, when it can be used again. The



orange colored solutions are mixed, allowed to settle, and finally filtered. The author found 50 c.c. of this solution capable of dissolving 1 grm. of HgS. (*Fres. Zeit.*, **26**, 15-18.) J. F. G.

### **Determination of Nitrogen in Fertilizers containing Nitrates.** A. STUTZER and O. REITMAIR.

To determine the total nitrogen in fertilizers containing nitrates, place 1 grm. of the sample in a 350 c. c. flask, and 25 c. c. water, evaporate and dry at 100°-110° C. The object of dissolving in water is to distribute the nitrate over considerable surface in order to give the phenol sulphuric acid mixture a better opportunity to act on the same. To the dried residue after cooling, add 50 c. c. sulphuric acid containing 20 g. phenol per liter. After reaction, add 2-3 g. dry zinc dust (free from nitrogen), also 1 to 2 drops of metallic mercury and boil over a flame. In 1½ hours conversion into ammonium sulphate is complete, and distillation for NH<sub>3</sub> can be undertaken. (*Rep. d. Anal. Chem.*, **7**, p. 4.) J. F. G.

### **Presence of Nitrates and Nitrites in Milk an Evidence of Adulteration.** M. SCHRODT.

Nitrates and nitrites are not normally found in milk, even if they are contained in the fodder of the cow. To prove this, the author fed two cows for five days on beets to which ten grammes daily per head of saltpetre was added. In no case was the presence of nitrates or nitrites detected in the milk. The method used was that of Soxhlet, the reagent used being diphenylamine. (*Bied. Centr.*, 1886, 629.) R. W. M.

### **Adam's Method for Milk Analysis** ALLEN, CHATTAWAY AND THOMSON.

Allen rolls up a piece of string with the blotting paper, thus keeping the folds from touching each other and exposing a larger surface to the action of the ether. A cap of filter paper is also tied over the bottom of the coil. With this modified coil suspended by a loop in the string, 5 c.c. of milk may be run on the coil without fear of loss, thus avoiding two weighings. Thomson

recommends distributing the milk on an extended strip of filter paper, drying quickly, coiling and then extracting in the usual manner. (*Analyst*, 11, 71 *et seq.*) R. W. M.

### **Distinguishing Between Natural and Artificial Butter by Means of the Refractometer.** J. S. KALIVEIT.

One gramme of the solid, previously filtered fat is weighed out and surrounded with ten to twelve layers of filter paper, so that the fat can be absorbed. The whole is then brought between two plates, the inner sides of which are covered with parchment paper, and then placed in a Koch culture apparatus at a temperature of from 16°–20°. After several hours a weight is placed on the upper plate, and after several more hours the paper coverings are carefully removed from that portion of the fat that has remained solid. This is weighed and the fluid fat is extracted from the paper with benzine, the benzine driven off on the water bath, the remaining fat cooled at a certain temperature, weighed and its index of refraction determined. In the case of natural butters the following results were obtained :

At 20° the per cent. of solid fat was 30.49%–32.89% and the fluid portion 67.91%–69.51% while the index of refraction was 1.4657–1.4659. At 16° the results were : solid fat 53.12%–55.65% ; fluid portion 44.35%–46.88% ; index of refraction 1.4644–1.4646, and for intermediate temperatures figures between the above were obtained.

With oleomargarine the proportions of the fluid and solid fat at 20° were : solid fat 17.17–20.09% ; fluid fat 79.91–82.83% ; index of refraction 1.4692–1.4733.

At 12° the solid fat was 54.77–34.91, the fluid fat 45.23–65.09%, and the index 1.4721–1.4742 ; and intermediate results were obtained at intermediate temperatures.

Mixtures of butter and oleomargarine showed results corresponding to the percentage of butter contained in them, and varying widely from those given by pure butter. The author draws the following conclusions : If the percentage of fluid fat at 17° is noticeably greater than 50%, and if the index of refraction at this temperature is greater than 1.4650 (water=1.330), the sample is not genuine. (*Rep. d. anal. Chem.*, 1886, 236.) R. W. M.

**Detection of Salicylic Acid.** C. O. CURTMAN.

To 4 c.c. of the liquid under examination 2 c.c. of methyl alcohol and 2 c.c. pure sulphuric acid are added ; the liquid is then heated for 2 minutes, allowed to cool 8-10 minutes, and then heated just to boiling. If salicylic acid is present, a distinct odor of oil of wintergreen is perceived. If only present in minute amounts, it may be necessary to allow the liquid to stand and to heat a third time. In examining condensed milk, fats, etc., the sample is previously digested with dilute alcohol at 20-30, with frequent agitation for some hours. After filtering and concentrating it is treated as above. .001 part of salicylic acid can be thus detected. (*J. Pharm.* [5], 14, 523.) R. W. M.

**Detection and Colorimetric Estimation of Salicylic Acid.** M. FREHSE.

The following precautions are necessary in using the ferric chloride method. The standard liquid with which the check determination is made should be freshly prepared. The salicylic acid should in every case be extracted with ether and no attempt at its direct determination should be made even in very slightly colored liquids. The solution of ferric chloride used should be very dilute, since a slight excess destroys the color. In distillation, a part of the salicylic acid is carried away with the watery vapor. (*Journ. de Pharm. et de Chim.*, Dec. 1, 1886.) R. W. M.

**Detection of Salicylic Acid in Foods.** H. TAFFE.

The author agitates the suspected sample with a mixture of equal parts of ethylic and petroleum ethers. This will extract even very minute amounts of salicylic acid which can be submitted to further examination. (*Bul. Soc. Chim.*, 46, No. 12.) R. W. M.

**Separation of Strychnine and Morphine from Fatty Matters.** M. FOCKE.

Exhaust the substance with hot alcohol and acidify with tartaric acid. When cool, filter and evaporate on water bath. Take up residue with ten times its weight of water and precipitate with an

excess of  $\text{Ba}(\text{OH})_2$ . After standing, precipitate with excess of  $\text{H}_2\text{SO}_4$ , allow to settle and precipitate with  $\text{BaCl}_2$ . Filter and dry on water bath until all the  $\text{HCl}$  is driven off. Take up residue in absolute alcohol and evaporate again. Dissolve in water and remove fats with ether. Make aqueous solution alkaline, exhaust with ether, evaporate ether and from residue take up alkaloids with dilute  $\text{HCl}$ . (*Jour. de Pharm. et de Chim.* [5], Oct. 15th, 1886.)

R. W. M.

### Determination of Indigo on the Fibre. A. RENARD.

Ten grms. of fibre dyed in indigo blue are put into a flask with 200 c.c. of a neutral solution of sodium hydrosulphite mixed with milk of lime. This solution is prepared by adding 2 litres of water and 100 c.c. of milk of lime to 100 c.c. of hydrosulphite of soda prepared with bisulphite at  $35^\circ$  B. Heat on the water bath at  $60^\circ$ – $70^\circ$ ; the fibres become yellow. A current of gas is then passed into the flask until all blue color has disappeared; the liquid is decanted quickly into a graduated cylinder, cooled, and the amount of liquid decanted is read off;  $\text{HCl}$  is added, and after 12 hours the indigotine is collected on a filter, washed and dried; filter and indigotine and titrate. The indigotine is titrated by Muller's method. (*Bul. Soc. Chim.*, 47, 39.)

M. L.

### Detection and Determination of Lactic Acid. R. PALM.

When lactic acid is treated with lead acetate and alcoholic solution of ammonia, it is uniformly precipitated as a heavy granular insoluble compound of the composition  $3\text{PbO}, 2(\text{C}_3\text{H}_5\text{O}_3)$ . The precipitate is absolutely insoluble in alcohol.

To detect free lactic acid, extract the finely divided material with ether. Evaporate the ether after removal, extract the ether residue with water and filter. To this solution add an excess of  $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$ , and, in case of a precipitate, filter and add to the filtrate alcoholic ammonia as long as a precipitate is produced. The lactic acid is thus precipitated as a lactate of lead.

When combined lactic acid is to be determined, the material must first be digested with dilute  $\text{H}_2\text{SO}_4$ , and then extracted with ether, etc., as above. Loss on ignition of the lead lactate gives

the amount of lactic acid. Or the acid can be displaced by  $H_2S$  and extracted with ether. Instead of precipitating the purified lactic acid with alcoholic ammonia and lead acetate, freshly precipitated lead hydrate may be used, which, however, gives a precipitate of irregular composition. (*Fres. Zeit.*, 26, 33-35.)

J. F. G.

**A Burette without Graduations.** A. BEUTELL and F. W. DAFERT.

A burette intended to measure always the same volume of liquid, which it does with the greatest accuracy. (*Rep. anal. Chem.*, 7, 187.)

J. F. G.

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## INDUSTRIAL CHEMISTRY.

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### Chevallot's Process for Waterproofing.

The material is first treated in a bath composed of 4 kilos casein mixed with 20 litres of water, to which 100 grammes powdered chalk and 2 kilos of a neutral soap dissolved in 24 litres of water are added. The material will take up its own weight in this bath. It is then treated in a bath of aluminium acetate at  $50^{\circ}$ - $60^{\circ}$  C., and finally washed in boiling water. The solution of the aluminium salt renders the casein insoluble, and insoluble aluminium salts of the fatty acids are formed which are attached by the boiling in water to the surface of the fibre under treatment. (*Ding. polyt. Jour.*, 263, 64.)

R. W. M.

**Limits of Fusel Oil in Spirituous Liquors.** G. BOLÄNDER and J. TRAUBE.

The authors consider the permissible limit of 0.3% fusel oil in spirituous liquors too high, and, as the result of recent examinations, recommend 1 to 1.5% as the maximum amount. (*Rep. anal. Chem.*, 7, 168.)

J. F. G.

## Abstracts of American Patents Relating to Chemistry.

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

January 18th, 1887.

**356,087.**—Double-pressure percolator. E. S. Anderson.

**356,133.**—Separating ammonium chloride from solutions by refrigeration. G. Jarmway.

**356,242.**—Water filter. R. L. Darragh.

**356,247.**—Apparatus for generating gas. A. A. Harwood.

**356,291.**—Process for obtaining iodine from bittern. F. C. Phillips.

The iodine is liberated from its chemical combination, absorbed by an oily or tarry substance, extracted from the latter by an alkali, and then freed and distilled from the alkali.

**356,292.**—Extracting bromine and iodine from bittern. F. C. Phillips.

**356,367.**—Manufacture of water proof building paper. I. W. Marshall.

**356,368.**—Manufacture of dyestuffs. J. A. Matthieu.

**356,398.**—Treating and refining cocoanut oil. A. P. Ashbourne.

The cocoanut meat is steamed or boiled, and the oil removed. It is refined by means of sugar, eggs, alum and salt.

**356,411.**—Composition for packing joints and other purposes. T. McSweeney.

Consists of rosin, mineral asphaltum, black wax tailings, and yellow wax tailings.

January 25th, 1887.

**356,476.**—Process of and apparatus for manufacturing illuminating gas. J. J. Johnston.

**356,477.**—Process of and apparatus for manufacturing illuminating gas. J. J. Johnston.

**356,505.**—Mixed paint. H. E. A. Saale.

An antifouling composition for ships' bottoms and submerged structures, consisting of barium carbonate, arsenic, powdered oyster shell, zinc oxide, red lead, quadroxalate of potash and a suitable dryer.

**356,587.**—Process of and apparatus for making gas. J. J. Johnston.

**356,610.**—Process of and apparatus for obtaining ammonia from coal. W. Young.

**356,611.**—Apparatus for separating vegetable from animal fibre. U. C. Allen and N. S. Potter.

**356,640.**—Process of manufacturing amalgams by electrolysis. A. S. Hickley.

**356,672.**—Red coloring matter from alphadiazobetanaphthylamine sulphonic acid. H. Vollbrecht and C. Mensching.

**356,720.**—Process of manufacturing gas. W. P. Lane.

*February 1st, 1887.*

**356,766.**—Curing and preserving meats. G. Holgate.  
Meat is cooled and cured by injecting liquefied gases.

**356,776.**—Incrustation preventive. S. W. Merryman.  
Consists of tannin, terra japonica, West Virginia oil and soda ash

**356,819.**—Filter. L. Bell.

**356,825.**—Composition for making blackboards, etc. J. D. Emack.  
Consists of slate dust, sulphur and Frankfurt black.

**356,863.**—Apparatus for the manufacture of gas. A. L. Allen.

**356,950.**—Carburetor. L. F. McNett.

**356,982.**—Process of welding wrought iron to cast iron. W. W. Burson.

Wrought iron is coated with aluminium or an alloy of aluminium, preparatory to being cast about with molten iron.

**357,030.**—Gas furnace. F. Radcliffe.

**357,103.**—Process of purifying gas carbon. F. H. Snyder.

**357,104.**—Compound for roofing and protecting metals. F. H. Snyder.  
Consists essentially of gas carbon.

**357,105.**—Refractory and non-conducting material from gas carbon for crucibles, furnace linings, glass pots, Bessemer converters, artificial stone, polishing wheels, etc. F. H. Snyder.

Consists of gas carbon, with or without cementing material.

**357,107.**—Obtaining sulphuric acid by the aid of waste steam. H. J. P. Sprengel.

**357,129.**—Manufacture of tannin extract from wood. A. Morand.

W. R.