ABSTRACTS.

GENERAL AND INORGANIC CHEMISTRY.

On the Alkaline Hydrates. E. J. MAUMENÉ.

An extended study of the hydrates of baryta, strontia, potash and soda.

In a previous paper on hydrates of baryta (presented to the *Acad. des Sciences*, June 11th, '83), it was shown that barium hydrate contains BaO 50%, HO 50%. The author denies in general the existence of monohydrates, whether acids or bases. Having fused the normal hydrate, containing 8.5 mols. of water, he does not obtain BaO HO but BaO $(HO)_{1.214}$. As to strontia, he concludes (Paper of January 21st, 1884, on strontium hydrate) that one hydrate is formed of one mol. of strontia and 9.583 mols. of water. He denies the existence of the hydrate SrO HO, but has found a normal hydrate SrO $(HO)_{0.821}$.

The normal hydrate of potassium oxide has been thought to be KO $(HO)_5$; Maumené establishes (Paper of October 20th, 1884), that the real hydrate is KO $(HO)_{5.22}$. This hydrate crystallizes; its solution in water is produced with absorption of heat. Another hydrate, obtained by the slow desiccation of the first, was found to be a definite hydrate KO $(HO)_{3.133}$. As for KO (HO) Maumené denies its existence. He obtained a well defined hydrate KO, $(HO)_{1.743}$; maintained for some time at a low red heat this became KO $(HO)_{1.207}$, and at a white heat KO $(HO)_{0.746}$. Similar facts are found in the case of sodium hydrate; the first hydrate crystallized is NaO $(HO)_{3.44}$ and not NaO $(HO)_5$, as has been believed. The second crystalline hydrate, prepared by igneous fusion of the first, is, according to Maumené, NaO $(HO)_{1.49}$. This hydrate, kept for 1½ or 2 hours at a white heat, becomes NaO $(HO)_{0.498}$. In conclusion, the author says : "Hydrates of KO, NaO, BaO and SrO, have no unique formula; they never have the typical composition MO, HO. All the other hydrates follow the same rule. A hydrate L, HO (L being any body whatsoever), only exists accidentally and in very rare cases." (*Bul. Soc. chim.*, **44**, *578.*) M. L.

Three New Compounds of Rhodium. C. VINCENT.

The sesquichloride, Rh_2Cl_6 can combine with the hydrochloride of mono-, di-, and trimethylammonium. The author describes the preparation of pure rhodium and of the chloride by the process of Sainte-Clair Deville and Debray.

The solution of rhodium chloride, concentrated and warm, mixed with the solution of the amine hydrochloride in the same condition, yields the double salt. An excess of the amine salt is necessary, the double salt being more soluble in water.

Monomethylammonium hydrochloride forms long prisms of a deep garnet red, apparently orthorhombic. They contain

Rh	21.45
Cl	51.57
NH_2 CH_3	25.90
	98.92

Dimethylammonium hydrochloride contanis $3H_2O$. The crystals, which are orthorhombic, have been measured by M. Friedel. The desiccated salt contains

	Found.	Theory.
Rh	22.82%	22.85%
Cl	46.40%	46.81%

The salt of trimethylammonium is very soluble; a slow evaporation gives rise to long prisms of a garnet color. Composition.

		Theory.
Rh	20.48%	20.90%
Cl	42.35%	42.86%

These three salts are decomposed by heat; the chlorine cannot be determined directly in the salt on account of the formation of a chlororhodiate of silver of a pink color. The salt must be previously fused with sodium carbonate in a platinum dish; sodium chloride is formed; the mass, after fusion, is treated with water and filtered to separate NaCl from rhodium oxide. (*Bul. Soc. chim.*, **44**, *11.*)

M. L.

On Aluminium Oxychlorides. P. Hautefeuille and A. Perrey.

The authors did not succeed in producing the direct combination of alumina and aluminium chloride, but obtained the oxychloride by passing a mixture of oxygen and vapors of aluminium chloride over metallic aluminium heated in a tube. The metal becomes incandescent, and yields a crystalline, very brittle substance. The proportions of Cl and O vary with the temperature of the reaction, oxygen being more abundant when the temperature has been higher. The body is not a mixture of Al_2O_3 and Al_2Cl_6, as the product of reaction is entirely soluble in very dilute acids and alkalies. Similar bodies are produced by passing Cl and O over aluminium. (*Comptes rend.*, **100**, *1219.*) M. L.

On Alloys of Cobalt and Copper. G. GUILLEMIN.

Those alloys are obtained by direct fusion under borax and charcoal. They contained from 1 to 6% of cobalt. They can be forged, wire-drawn and rolled like copper, but are more tenacious. Wires break under tension of from 25 to 36 kilos. per sq. mm. (*Comptes rend.*, **101**, *433.*) M. L.

Crystallized Zinc Hydrate. J. VILLE.

Prismatic zinc hydrate is easily prepared by treating neutral or basic zinc carbonate with a solution of potash of $\frac{1}{10}$ strength. The quantity of potash must be exactly double the amount necessary to displace the zinc. The easiest way to prepare zinc carbonate is to pass CO_2 into ZnO in the presence of water.

The prisms are more or less modified, and are flattened and truncated according to the concentration of the liquid and quantities of material. (*Comptes rend.*, **101**, *375.*) M. L.

Preparation of Arsenic Acid. A. JOLLY.

The directions given by Kopp to use dilute nitric acid (1.35) for the oxidation of arsenious acid are said by the author to be justified by the fact that both arsenical acids can combine in the proportions of 3 to 2, 2 to 1, and 1 to 1, but these combinations are destroyed by water. The combinations are well crystallized, but cannot exist in presence of dilute nitric acid. (*Comptes rend.*, **100**. *1219.*)
M. L.

On the Oxide of Thorium. L. TROOST.

The author, in order to determine whether the oxide is ThO_2 or ThO, tried to ascertain if it formed, like silica, a compound $XO_2P_2O_5$ (Hautefeuille and Margottet). By treating metaphosphoric acid with anhydrous thorium chloride, he obtained orthorhombic crystals, whereas silicum phosphate crystallizes in octahedra. Those crystals have the formula

$$ThO\ P_2O_5,\ \text{or}\ ThO_2\ 2PO_5.$$

On the other hand the vapor density, taken in Meyer's apparatus (atmosphere of nitrogen, bath of boiling zinc), was found to be 5.90, 7.01 and 7.49. These numbers are very near of 6.48, which corresponds to the oxide ThO, or (Th=58.1; O=8). *Comptes rend.*, **101**, *360.*) M. L.

Some Reactions of CO_2, CS_2 and CO_2. A. EILOART.

A mixture of CO_2 and vapor of CS_2 passed over copper at a high red heat, yields CO. When copper is omitted there is no decomposition of CO_2. The action is ascribed to nascent carbon resulting from decomposition of CS_2 in the formation of Cu_2 S ($CS_2+CO_2+2\ Cu_2=2\ CO+2\ Cu_2\ S$); a reaction which may be regarded as taking place in two stages, one of which involves the separation of C, the other its oxidation by CO_2. If SO_2 be substituted for CS_2, CO_2 is formed, amounting, under given conditions, to half of the volume of the issuing gas, less about 5% of CO resulting from a secondary reaction. CS_2 and SO_2 react below a red heat, even without the intervention of copper, to form CO_2. Experiments with carbon carefully purified and heated in a current of SO_2 showed also an oxidation of C at the expense of SO_2. (*Chem. News*, 52, *184.*) A. A. B.

Absorbents for CS_2 Vapor. A. EILBORT.

In order to separate these vapors from mixtures of CO_2 and CO in gas analysis, the author tried various absorbents by passing a mixture of air and vapor of CS_2 through them. The substances tried were caoutchin, roll sulphur (powdered), iodine (followed by solid paraffin to stop the iodine vapor), potassium triiodide (with paraffin guard), solution of Br in K Br, and linseed oil. Iodine is the best absorbent but inconvenient in extended use. Linseed oil introduced with the mixture of gases into a Crum's tube, was found to answer every purpose. (*Chem. News*, **52**, *184.*)

A. A. B.

On the Source of the Hydrogen Occluded by Zinc. G. WILLIAMS.

The author has already suggested that the hydrogen in zinc dust and in meteorites may have a common oxygen, *i. e.*, exposure to a moist atmosphere. Experiment now shows, in respect to zinc dust, that the yield of hydrogen is much increased by wetting and subsequent drying of the dust. A sample of dust so treated yielded, on heating, almost twice the volume of hydrogen contained in the original dust. It is also found that zinc dust absorbs water readily from a moist atmosphere and that the volume of hydrogen obtained from zinc so treated was about seven times that from an equal weight of the original dust. (*Chem. News*, **52**, *205.*) A. A. B.

Oxydation of Iodine in the Process of Nitrification. A. MUNTZ.

To explain the presence of iodic acid in the sodium nitrate, the author tried to ascertain whether the organism which produces nitrification could not at the same time oxidize iodine. Potassium iodide put in the centre of a body undergoing nitrification gave rise to iodic acid. (*Comptes rend.*, **100**, *1136.*) M. L.

ORGANIC CHEMISTRY.

Picrylsulphonic Acid and Sodium Picrylsulphonate. C. WILLGERODT.

Fuming nitric acid gives with picryldisulphide only picric acid and sulphuric acid. Sodium picrylsulphonate is easily formed by heating an acoholic picrylchloride solution, with an excess of sodium acid sulphate. It crystallizes with two mol. water in colorless rhombic or rhombohedral crystals. By the addition of an alkali it is decomposed into picrate and sulphite. Picrylsulphonic acid is obtained by adding sulphuric acid to the sodium salt. It crystallizes with two mol. water. Its melting point is 185°. It is easily soluble in water, alcohol and ether, soluble with difficulty in chloroform, insoluble in benzol. (*Jour. prakt. Chem.*, **32**, *117.*) F. P. V.

Studies on Fatty Bodies. CH. DUBOIS and L. PADÉ.

A contiuation of previous papers, it contains tables showing the solubility of fatty bodies in absolute alcohol, acetone, acetic ether and amylic alcohol; the temperature of solidification, and the solubility of the fatty acids in mixtures of animal fats with butter, and acids. The conclusions are that a knowledge of the solubility of the fatty acids is indispensable in the analysis of a butter, and that this knowledge is often sufficient to decide the presence of a foreign fatty body. (*Bul. Soc. chim.*, **44**, *602.*) M. L.

On Pathological Urine. A. VILLIERS.

The results of Bouchard and Pouchet, who have announced the discovery of alkaloids in normal urine, are questioned by the author. Examinations of many samples of urine taken from nine subjects in good health, gave negative results in seven cases. In the urine of persons suffering from different diseases, e. g., roseola, diptheria, pneumonia, phthisis and abscess of the head, but to whom no alkaloid had been administered medicinally, alkaloids were found. Bouchard has found them in the urine of typhoid patients. The author has also found alkaloids in his own urine during slight indisposition, but none when in health. He concludes that while normal urine is free from these bodies, slight derangements of the system may lead to their formation. (*Arch. de Pharm.*, **1**, *12.*)

A. A. B.

Composition of Edible Swallow's Nests. J. R. GREEN.

The mucilaginous matter composing this well known Chinese delicacy is, according to Everard Howe, the saliva of the bird itself and is a nitrogenous substance, intermediate between albumin and gelatine. The author has studied this substance anew. It is found to swell up in water, but not to dissolve, either cold or hot, but dissolves readily in lime water or baryta water, yielding a solution which becomes opalescent on addition of acetic acid, but is not precipitated. It gives an abundant red precipitate with alcohol, and shows the xanthoproteic reaction, but is not affected by Millon's reagent. These reactions indicate a glandular product, but it is not known whether the substance is a salivary or a peptogenic secretion. It possesses no power of fermentation, does not transform starch nor act upon fibrine. It resists the action of pepsine, but is attacked by the pancreatic juice. The author believes it to be analogous to the mucine of Eichwald, but finds it difficult to fix its place among the albuminoids. (*Arch. de Pharm.*, **1**, *14.*)

A. A. B.

Heat of Combustion of Certain Amines. A. MULLER.

The author tells how the purity of each body was determined. The combustion was effected in Berthelot's calorimeter. The following results were obtained :

	Heat of combustion of one molecule.		Heat of combustion of 1 grm.	Heat of formation of the molecule.
	Gas.	Liquid.	Gas.	Gas.
	Cal.	Cal.	Cal.	Cal.
Monomethylamine	256.9	....	8.276	9.6
Dimethylamine	426	....	9.458	3.5
Trimethylamine	577.6	....	9.783	14.9
Diethylamine	724.4	716.9	9.918	31.1
Triethylamine	1047.1	1038.3	10.363	34.4
Monoisoamylamine	876.4	867.6	10.069	42.1

The number 577.6 found for trimethylamine is quite different from 592, that found by Berthelot. The preparation of the amine is described. With the above figures the heat of substitution of the radicals for the H of NH_3, is calculated, using J. Thomsen's formula. (*Bul. Soc. chim.*, **44**, *609.*)

M. L.

On the Chemical Composition of the Milk of the Porpoise. PURDIE.

A small quantity of milk was obtained from the *mamma* of a porpoise recently caught in the Bay of St. Andrews. The milk was a thick, yellow liquid of fishy smell and of sp. gr. differing little from that of water. An analysis, which was somewhat imperfect, because of the small quantity of material, showed the following composition:

Water,	41.11	Fat,	45.80
Albuminoids,	11.19	Milk Sugar (?)	1.33
Ash,	0.57		

(*Chem. News*, **52**, *170.*) A. A. B.

ANALYTICAL CHEMISTRY.

Behavior of Nitrates in Kjeldahl's Process. R. WARRINGTON.

The application of this well known process for determination of nitrogen in organic bodies fails in respect to nitrogen of nitrates. Kjeldahl has shown that a portion of this nitric nitrogen is converted into ammonia in his process, under the influence of organic matter. The removal of nitrates by heating with oil of vitriol and ammonium sulphate, a method used in other cases, is inapplicable here for the above reason, although the author shows that the loss of ammonia (probably occurring through formation and subsequent decomposition of ammonium nitrate), can be practically prevented by addition of a small quantity of water. Apparently the most available method is one in which the nitrates are decomposed before adding concentrated sulphuric acid to the organic substance. Such a method the author finds in treatment of the organic substance. containing nitrates, with an excess of ferrous sulphate and strong HCl. Nitric nitrogen being thus removed, the mass is dried and the process of Kjeldahl is applied as usual. The results are fair. Further experiments are promised. (*Chem. News*, **52**, *162.*)

A. A. B.

Note on Warrington's Modification of Kjeldahl's Process. H. B. YARDLEY.

The loss of N on addition of water to the mixture of conc. H_2SO_4 and organic matter, regarded by Warrington as due to action of nitrous acids on ammonia or amides, may be so explained when nitrates were originally present, but in their absence there is still a loss of nitrogen, which the author ascribes to decomposition of nitrogenous matter by SO_2 resulting from the reaction of H_2SO_4 on organic matter.

Mixtures of wool dust and chamber acid (H_2SO_4 90° Tw.) were heated to disintegration of the dust, after passage of CO_2 to remove air, and CO_2 was again passed to remove gases set free by the action of H_2SO_4. After absorption of CO_2 by potash, a residue of nitrogen was found. In a similar experiment in which the mixture was distilled, the distillate had the odor and taste of SO_2, and on neutralization and evaporation yielded N by combustion with soda-lime. (*Chem. News*, 52, *220.*) A. A. B.

A Modification of Kjeldahl's Method. H. HILFAHRT.

The author adds a metallic oxide or salt to the sulphuric acid serving for the destruction of organic matter, with the effect of hastening the process. Cupric sulphate is preferred. The effect is said to be a saving of seven-eighths of the time otherwise necessary. (*Chem. News*, 52, *221, from Mon. Sci.*) A. A. B.

Digestion Furnace for Kjeldahl Nitrogen Determinations. N. KREUSLER.

This gas furnace is constructed with burners, in pairs, opposite one another, with simple chimney and screw-valves. The digestion is carried on in glass flasks reclining on wire gauze over the burners. (*Zeit. anal. Chem.*, 24, *393.*) F. P. V.

Uranium Acetate as a Reagent for Albuminoids. N KOWALEWOKY.

Under certain conditions, uranium acetate gives a precipitate with albuminous bodies. This precipitate is somewhat soluble in water. It retains the characteristics of albumen, but uranium is only detected after acidifying. For washing the precipitate it is well to use alcohol. The precipitate is soluble in acids. In alkalies it is soluble with decomposition. A precipitate is gotten when only 019% albumen is present. In albuminous urine the test may be carried out by redissolving the precipitate of phosphate and albuminoid, and then adding concentrated nitric acid which causes the reseparation of the albumen. (*Zeit. anal. Chem.*, 24, *551.*)

F. P. V.

Critical and Experimental Review of the Knop-Hufner Method for the Determination of Urea. Carl Jacobj.

The modifications of the method are noted, but the original directions of Knop are followed in the experiments, making use of the empirical correction advised by Hüfner. The method is tested with solutions of pure urea, normal and pathological urine, and urine to which glucose or aceto-acetic ether have been intentionally added. Comparative determinations are also made with the Liebig-Pflüger method. Certain adverse criticisms on the Knop-Hüfner method are discussed, and the author concludes that it is better suited for accurate scientific researches than the Liebig-Pflüger method. (*Zeit. anal. Chem.*, 24, *307.*)

F. P. V.

On the Detection and Determination of the Bases of the Pyridine and Quinoline Series. O. de Coninck.

The author has studied quinoline resulting from the decompositions of brucine by caustic potash. The fraction passing from 150° to 170°, contains chiefly β-lutidine, and a small quantity of an isomeric lutidine.

He submitted the chloroplatinates to Anderson's reaction (boiling water). The β-lutidine is entirely transformed, while the other base is nearly all transformed into the double salt.

$$[(C_7H_9NCl)_2, PtCl_2 + C_7H_9(NCl)_2 PtCl_4.]$$

	Found.	Theory.
Pt	33.20%	33.41%
Cl	29.80%	30.11%

This salt, treated again with boiling water, gave the modified salt.

$$(C_7H_9NCl)_2 + PtCl_2.$$

These reactions establish, beyond a doubt, the existence of another pyridine base besides β-lutidine.

Determinations of this base, by the means of the platinochloride and of the aurochloride, were made.

As for the double salts of the pyridine dihydrides, the modification of the platinochloride ($PtCl_2$ compound), must be made with tepid water. The gold salts cannot be handled on account of their tendency to decompose. The author uses this ready reduction of the gold double salts to characterize the quinoline and pyridine hydrides in the presence of the pyridine and quinoline bases. (*Bul. Soc. chim.*, **44**, *617.*) M. L.

Rapid Determination of Nitric Acid. A. Grandval and H. Lajous.

This process depends upon the transformation of phenol into picric acid by the nitric acid present, and the comparison of the color of the ammonium picrate formed with a standard solution of this last salt.

The nitric solution is neutralized and evaporated to dryness, the residue is treated with sulphophenic acid (30 gms. pure phenol, 37 gms. pure SO_3). Water and excess of ammonia are then added. The operation is repeated with a standard solution of potassium nitrate ; then the solutions are compared by means of Duboscq's colorimeter. This process is rapid and delicate; nitric acid determinations in air can be made in quick succession by passing a known volume of air through a solution of sodium carbonate, passing 50 liters for each determination. (*Comptes rend.*, **101**, *62.*)
M. L.

The Combustion of Carbohydrates by Means of Chromic Acid. C. F. Cross and E. J. Bevan.

In the course of their researches upon cellulose, the authors have tried processes involving the above principle. An apparatus like that of Fresenius & Will for estimation of CO_2 was first tried but later a modification of the Schiebler apparatus was found more suitable. The substance, mixed with or dissolved in strong H_2SO_4, is contained in a small flask in which is placed also a short tube containing chromic acid, which can be mixed with the substance as desired, by including the flask. The conversion of C into CO_2 is not complete, but inasmuch as the two oxides of carbon CO and CO_2 have the same volume, the volume of gas evolved is a representative of the carbon contained in the substance. Combustions of Swedish filter paper by this method yielded C 43.65%—43.80%. Theory for cellulose 44.4%. The applicability of this method to other organic substances is to be further tested. (*Chem. News*, **52**, *207*.) A. A. B.

Detection and Determination of the Sulpho- Compounds of Fuchsine in Wines. P. Cazeneuve.

The author describes the process of Ch. Girard (potash and mercuric acetate), and the process of M. Bellier (magnesia and mercuric acetate). In the last the wine (10 c.c.) is mixed with the powder and boiled. The solution is filtered, and passes colorless. The addition of an acid gives a red coloration in case of the presence of a sulpho- compound of fuchsine.

50 c.c. of the wine are shaken with 50 grams of manganic oxide for 5 minutes. Only the wines colored with the sulpho-compounds of fuchsine remain red; all the others are discolored, even those containing fuchsine, and especially the azo- compounds. (*Bul. Soc chim.*, **44**, *611*.) M. L.

A Modification of the Molybdate Method of Estimating Phosphorus in Steel. E. F. Wood.

The exact determination of phosphorus in steel by precipitation from the nitric acid solution, without evaporation to dryness is impossible. The author finds the loss of phosphorus to be about one-third. He avoids the error by dissolving steel in nitric acid containing chromic acid.

The yellow precipitate obtained by molybdate is dried at 100°, and weighed directly. If 1.63 grm. of steel be taken for analysis, each mg. of precipitate corresponds to .001% P. Full details of the process are given. The process is said to be rapid and accurate. It is not applicable to cast iron. (*Chem. News*, **52**, *279*.) A. A. B.

Analysis of Staurotide. M. Coloriano.

This mineral is a silicate of iron and alumina; the author analyzed staurotide from the St. Gothard, and removed the foreign minerals by digestion in diluted hydrofluoric acid. The sample was finely pulverized, and treated under pressure at 210° with 9 c.c. of H_2SO_4 and 6 c.c. water for 1 grm. of mineral. The ferrous oxide is determined with permanganate. In one analysis he found :

FeO	9.13
Fe_2O_3	6.83
Al_2O_3	54.20
SiO_2	27.38
Water	1.43
	98.97

The author proposes for staurotide the formula,

$$5SiO_2,\ 6Al_2O_3,\ 2FeO,\ H_2O,$$

and he supposes that at the time of its formation staurotide was a silicate of alumina and of ferrous oxide, which was afterwards partly oxydized in the air. (*Bul. Soc. chim.*, 43, *427.*) M. L.

The Detection and Determination of Fluorine. G. Tammann.

This is a discussion of the methods in use, with experiments as to their usefulness. The author recommends in the case of soluble fluorine compounds the decomposition with silicic and hydrochloric acids, with the addition of potassium acetate and alcohol, filtering, washing with alcohol and titrating with potassium hydroxide (or gravimetrically substituting hydriodic acid for hydrochloric), then adding barium acetate and alcohol, filtering, treating the filtrate with alcohol containing hydrofluoric acid, and then weighing the barium silicofluoride, or converting it into barium sulphate. For difficultly soluble fluorides, first decompose with sulphuric acid in the apparatus in general use, determining the fluorine in the water of the absorption apparatus as above. The loss of fluorine during the incineration of organic substances is not prevented by an excess of barium hydroxide and sodium carbonate. (*Zeit. anal. Chem.*, 24, *328.*)

Determination of Potassium Acid Tartrate in Argol, etc. F. Klein.

The method adopted by the author depends upon the insolubility of the acid tartrate in a solution of potassium chloride. The systems of analysis in general use are also discussed. (*Zeit. anal. Chem.*, 24, *379.*) F. P. V.

Moisture Retained by Gases Dried by Means of Sulphuric Acid. E. W. Morley.

The author finds that the five-hundredth part of a millogram is retained per liter of air. This corresponds with the amount noticed by Dibbits as removable by phosphorus pentoxide from air dried by sulphuric acid. Experiments showed that one liter of air in passing through sulphuric acid (1.84 Sp. Gr.), took up one two-thousandth to one three-thousandth millogram of sulphur trioxide. For full description of the apparatus and method used, reference must be made to the original article. (*Zeit. anal. Chem.*, **24**, *533*.)

F. P. V.

A New Method for Determining Alumina. K. J. BAYER.

The method depends upon a precipitation and re-solution of the alumina with normal sodium hydroxide solution, adding then litmus and titrating with normal sulphuric acid to reddening. Another portion is precipitated and dissolved in the same way. Tropaeolin is added and the titration, with normal sulphuric acid, is carried out to the orange color of tropaeolin. The difference between the amounts of sulphuric acid used corresponds to the alumina present. (*Zeit. anal. Chem.*, **24**, *542*.) F. P. V.

Usé of Sodium Bromate in Volumetric Analysis. KRATSCHMER.

This salt, which is easily gotten by the addition of bromine in excess to hot sodium hydroxide solution, and may be purified by recrystallization, is shown by the author's experiments to be a convenient and satisfactory means for the titration of iodine solutions in volumetric analysis. It sets free from such solutions, when acidified with mineral acids, the exact amount of iodine corresponding to the oxygen it contains. (*Zeit. anal. Chem.*, **24**, *546*.)

F. P. V.

Separation of Zinc and Cadmium by Electrolysis. S. ELIASBERG.

The author having examined the conditions favorable to the success of Iver's electrolytic process for the separation of these metals, finds the most favorable conditions to exist when the metals are brought into the form of double oxalates, by adding potassium and ammonium oxalates. The amount of liquid should not exceed 90 c. c. ; and the liquid must be kept warm while a current of .01-.015 ampère is passed through for 6-7 hours. This is the time necessary for .15 grams of the metal. The cadmium separates uniformly and smoothly, and sometimes crystalline. (*Zeit. anal. Chem.*, **24**, *548*.) F. P. V.

Abstracts of American Patents Relating to Chemistry.

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

November 17th, 1885.

330,381.—Process of drying air for metallurgical operations. J. H. Cremer.

330.415.—Open hearth furnace for iron and steel. O. Murisier and P. C. Gilchrist.

The furnace is lined with calcined lime mixed with tar.

330,454.—Process of precipitating nickel and cobalt from solutions containing the same. C. H. Aaron.

The metals are precipitated as methylsulphocarbonates.

330,602.—Manufacture of cement. H. Mathey.

Cement rock is ground to fine powder and then calcined.

330,602.—Manufacture of lime. H. Mathey.

Limestone is crushed or pulverized and burnt in a revolving cylinder.

330,613.—Manufacture of rosin compounds. D. J. Ogilvy.

To form a vehicle for paints, printing inks, etc., rosin is saponified with an alkali, and then dissolved, preferably in a mineral oil.

330,687.—Process of purifying petroleum. J. H. Tiemann.

Powdered silicious ~~or~~ other inorganic substance is agitated with the mixture of acid and oil.

330,731.—Process of manufacturing coke. H. M. Pierce.

330,732.—Furnace for the manufacture of coke. H. M. Pierce.

330,747.—Process of producing illuminating gas. R. H. Smith.

Natural gas is heated to a sufficient temperature to decompose and convert a fluid hydrocarbon into a fixed gas, and such hydrocarbon is then brought in contact with the heated natural gas.

330,778.—Apparatus for making gas. W. P. Elliott.

Brief.—Coal is distilled in closed retorts and the resulting gas is passed separately to the main. Water-gas is generated in the fuel chamber or furnace below the retort chamber, is carbureted with oil vapor in the retort chamber and the mixed gas and vapor is converted into a fixed gas in the fixing chamber. The retorts are heated by products of combustion from the fuel and by the hot water-gas circulated around them.

330,815.—Manufacture of lactates. C. E. Avery.

November 24th, 1885.

330,884.—Apparatus for freezing liquids. E. Fixary.

330,894.—Safety paper for checks, drafts, etc. F. M. Hill.

Manganese ferrocyanide and hydrated ferric oxide are added to the paper pulp or sizing.

331,059.—Manufacture of β-naphthol-sulphonic acid. M. Hoffmann.

β-naphthol-γ-sulpho- acid is produced by first sulphonating β-naphthol α-monosulpho- acid or β-naphthol, and purifying the acid.

331,104.—Process of covering metallic objects with an electroplating of magnetic oxide. W. H. Winslow.

Brief.—Electroplates with iron, and then converts iron into magnetic oxide, by means of superheated steam.

331,105.—Magnetic-oxide-of-iron-plated ware. W. H. Winslow.

331,190.—Disinfecting and cleansing liquid for animals, etc. H. Endemann.

Consists of heavy oil of coal tar, spirits of wood tar, potash soap, and potash solution.

331,225.—Process of treating heating and illuminating gases. W. F. Browne.

331,243.—Manufacture of cement. W. Joy.

331,249.—Process of making zinc sulphide pigment. T. McFarlane.

December 1st, 1885.

331,312.—Composition for fireproofing and other preservative purposes. A. J. Martin.

A composition of glycerine, ammonium carbonate, ammonium chloride, potassium tartrate, potassium oxalate, and boric acid.

331,323.—Manufacture of pulp from woody matter. R. P. Pictet and G. L. Brélaz.

Wood is subjected to the action of a saturated solution of sulphurous acid, at a temperature not exceeding 100° C.

331,383.—Mixed paint. H. C. Dorr.

A ship paint consisting of oil of tar, gum shellac, calomel, and gypsum.

331,457.—Mode of and apparatus for making ice, refrigerating, etc. A. G. Southby.

331,541.—Baking powder. A. Peters.

Consists of calcium, magnesium, or strontium carbonate, and an acid sodium sulphate, or other equivalent acid sulphate of an alkali.

331,542.—Baking powder. A. Peters.

Consists of an acid calcium phosphate, and calcium, magnesium or strontium carbonate.

331,621.—Apparatus for making illuminating gas. F. Egner.

331,632.—Polishing composition. H. L. Haas.

A compound of tar and fatty substances and polishing materials.

331,702.—Method of treating cotton seed and analogous oils. J. B. Grant and A. Mason.

The oil is partially distilled in the presence of carbon dioxide, and then saturated with the gas.

December 8th, 1885.

331,775.—Food compound. A. A. De Puy.

Consists of sugar, potassium nitrate, glycerine, sodium bicarbonate, sodium protoxide, sodium chloride, water, and milk.

331,777.—Dyeing aniline black. A. N. Dubois.

The fabric is first soaked in a bath of soluble castor oil, then for about three hours in a bath consisting of water, aniline oil, hydrochloric acid, ferric nitrate, and potassium bichromate, after which it is finished in a bath of soap.

331,810.—Cleaning fluid. C. T. Mutchler.

Consists of alcohol, sulphuric ether, salts of tartar, potassium cyanide, and ammonium hydrate.

331.860.—Apparatus for extracting mercury from its ores. H. Berrens.

331,903.—Process of manufacturing illuminating gas. J. W. Mitchell.

The process consists in, first, bringing a body of fuel to incandescence; second, passing air and superheated steam simultaneously through the fuel; third, injecting superheated steam and crude petroleum into a chamber with which the water-gas generating chamber is connected; and, fourth, purifying the gas.

331,942.—Tanning hides and skins. T. R. Clark.

The hides are repeatedly treated with a compound of potassium carbonate, water, and animal oil.

331,964.—Manufacture of benzylated methyl violet. H. Hassencamp.

331,965.—Manufacture of benzylated acid violet. H. Hassencamp.

Methyl violet is reduced to its leuco-base, which is benzylated, and converted into its leucosulpho- acid, from which the sulpho- acid of the dye stuff is obtained by oxidation.

332,087.—Apparatus for manufacturing non-luminous heating gas. J. Kidd.

December 15th, 1885.

332,320.—Apparatus for distilling wood. T. H. Berry.

332,358.—Producing chloriodine double combinations from pyridine and chinoline bases. E. Ostermayer and M. Dittmar.

Pyridine, chinoline, tetrahydrochinoline or chinoline methylate are treated with chloriodhydrochloric acid.

332,364.—Process of producing photographs in permanent pigments. W. W. Sherman.

332,441.—Process of making crystalline glass. E. A. Savary.

The glass is coated with a solution of Epsom salt, which is allowed to dry, and the coated surface is treated with hydrofluoric acid.

332,458.—Process of manufacturing fluxes. H. F. Taylor and G. Leyshon.

332,497.—Artificial fuel and process of making the same. W. H. Cory.

Carbonaceous matter and potassium or sodium silicate are mixed together, and the mixture is subjected to the action of an acid to set free the alkali. The resulting mass is compressed into cakes.

332,498.—Carbonaceous fuel and process of making the same. W. H. Cory. Consists of carbonaceous dust, potassium silicate, and alumina.

332,528.—Dye stuff made from diazonaphthaline. M. Hoffmann.

332,569.—Apparatus for manufacturing illuminating gas. J. L. Stewart. *Brief.*—Heating and illuminating gases are made in the same apparatus by combustion of fuel in the decomposing chamber and of the resulting gaseous products in a steam superheating chamber, then superheating steam by passage down through such superheater, decomposing it by passage down through the incandescent fuel and conducting the resulting gases off at the base of the fuel chamber. When the apparatus is reduced to the proper temperature, oil spray is injected into the top of the superheating chamber by means of a jet of waterrgas under pressure, and the resulting oil vapor is converted into hydrocarbon gas by passage through such chamber.

December 22d, 1885.

332,705.—Apparatus for chloridizing gold, silver and other ores. H. H. Eames.

332,736.—Metallic alloy or compound in producing the same. H. J. F. Niewerth.

The process of alloying heavy metals with metallic sulphides, which consists in first dissolving the sulphide of the metal in molten zinc, then mixing the product with the heavy metals, and finally removing the zinc by cuppellation.

332,751.—Production of cold. A. J. Rossi.

Uses carbon dioxide with sulphuric ether.

332,751.—Production of cold. A. J. Rossi.

Uses a ternary liquid consisting of carbon dioxide combined with a binary volatile absorbent.

332,756.—Stove polish. W. T. See.

Consists of water, dextrin, plumbago and lamp black.

332,829.—Manufacture of β-naphthylaminesulpho- acid. H. Prinz.

The β-naphtholsulpho-acid described by Schaefer is treated with ammonia at a temperature of about 180°-200° C.

332,830.—Red coloring matter from β-naphthylaminesulpho- acid. H. Prinz.

Obtained by combining β-naphtholdisulpho- acid with the diazo-compounds of β-naphthylaminesulpho- acid.

332,868.—Composition of matter for waterproofing paper. C. S. Bird.

Consists of resin, paraffin and sodium silicate.

332,957.—Process of manufacturing illuminating gas. B. Sloper.

Gas is generated by simultaneously acting upon metal scrap and marble dust with dilute acid. The resulting gas is enriched with hydrocarbon vapor.

333,034.—Manufacture of color producing acids. H. Vollbrecht and C. Mensching.

A new naphtholdisulpho- acid, derived from naphthylaminesulpho- acid.

333,035.—Coloring matter derived from α-naphtholdisulphonic acid. H. Vollbrecht and C. Mensching.

The diazoxylol compound of α-naphtholdisulpho- acid.

333,036.—Nitronaphtholsulphonic acid. H. Vollbrecht and C. Mensching.

333,037.—Manufacture of dyestuff from naphthol. H. Vollbrecht and C. Mensching.

Produced by the reaction of diazoazobenzol with the solution of the sodium salt of naphtholdisulpho- acid.

330,038.—Manufacture of dyestuff from naphthol. H. Vollbrecht and C. Menschinger.

Produced by the reaction of diazotoluol with the solution of the sodium salt of naphtholdisulpho- acid.

333,039.—Coloring matter derived from diazobenzol and α-naphtholdisulphonic acid. H. Vollbrecht and C. Mensching.

333,040.—α-naphtholsulphonic acid. H. Vollbrecht and C. Mensching.

333,041.—Coloring matter derived from diazobenzol and α-naphthol. H. Vollbrecht and C. Mensching.

Produced by the reaction of diazobenzol with the sodium salt of naphtholmonosulpho- acid.

333,042.—Coloring matter derived from α-naphthol and diazotolnol. H. Vollbrecht and C. Mensching.

Produced by the reaction of diazotolnolsulpho- acid with the sodium salt of naphtholmonosulpho- acid.

W. R.