

ABSTRACTS.

GENERAL CHEMISTRY.

Note on the Diamond. ALBERT KRAUSE.

The proof that diamond and carbon are identical has not heretofore been strictly defined. It has been shown only that the atomic weight is the same, and that on combustion a gas is furnished which precipitates baryta or lime water. Consequently it has not been shown to be impossible that diamond and carbon may be similar to each other, as nickel is to cobalt. An exact determination of the carbon dioxide formed in each case should decide the question. A derivative of carbon dioxide, obtained from diamond and from carbon, was tested in regard to such constants as melting point, solubility, form of crystals and power of conducting electricity.

As a result it was found that sodium carbonate prepared from diamond is absolutely identical with ordinary sodium carbonate. (*Ber. d. chem. Ges.*, **23**, 2409.) L. H. F.

On Vanadium Sulpho Salts. KRÜSS and K. OHNMAIS.

Indications of the existence of vanadium sulpho salts existed previously. A series of beautifully crystallizing salts of this kind have now been prepared. (*Ber. d. chem. Ges.*, **23**, 2547.)

L. H. F.

Researches on Beryllium. KRÜSS and MORAHT.

As a result of these researches the atomic weight of Be was found to be 9.028 if $O = 15.96$; or if $O = 16$ then $Be = 9.05$. (*Ber. d. chem. Ges.*, **23**, 2552.)

L. H. F.

The Constitution of some double salts of Rhodium. K. SEUBERT and K. KOBÉ.

The following salts were prepared and analyzed: rhodium-potassium-chloride; rhodium sulphite with sodium sulphite,

rhodium sulphate with sodium sulphate. This last mentioned salt must be considered an anhydrous rhodium-alum of the formula: $Rh_2(SO_4)_3 Na_2 SO_4$. (*Ber. d. chem. Ges.*, **23**, 2556.) L. H. F.

Splitting of Ammonium Nitrite by Means of Platinum Sponge. O. LOEW.

The facility of decomposition of ammonium nitrite, in aqueous solution (by warming) into nitrogen and water, decreases on increasing dilution. The more dilute the solution, the higher is the temperature required for decomposition, and thus very dilute solutions may be concentrated on the water bath to a certain degree without decomposition.

The author finds that, while a 4 to 5 per cent. solution, even on boiling is only slowly decomposed, this decomposition takes place at ordinary temperature in the presence of spongy platinum.

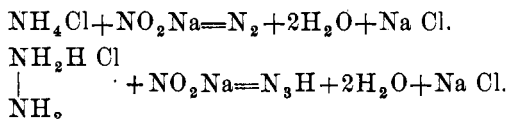
In a former paper it had been shown, that nitrogen in presence of strong alkalies and spongy platinum, reacts with water. Here we see the reverse action ; free bases being absent, platinum sponge causes the liberation of nitrogen with formation of water. (*Ber. d. chem. Ges.*, **24**, 3018.) L. H. F.

On Hydrazoic Acid (Azoimide). TH. CURTIUS.

Hydrazoic acid, N_3H , a surprising analogue to halogen hydrides, is formed under certain conditions by the action of nitrous acid upon diamide, water being split off. It has the constitution :



It is to be expected that just as ammonia and nitrous acid furnish nitrogen, hydrazinmonochloride and nitrites would yield azoimide :



However, it seems to be difficult to prepare azoimide in this direct manner. On the other hand the study of reactions between

hydrazinhydrate and benzoylglycolic acid ester or hippuric acid ester lead to the discovery of this well characterized, easily prepared and interesting compound of nitrogen and hydrogen.

Organic derivatives of azoimide have long been known. Griess discovered the diazobenzolimide and E. Fischer prepared it from nitrosophenylhydrazin, this latter being the phenylester of hydrazoic acid.

Azoimide is a gas of a very remarkable, pungent odor. Even in a state of dilution it creates dizziness and headache, with inflammation of the mucous membrane of the nose. Its aqueous solution painfully cauterizes the epidermis.

Azoimide is a strong, monobasic acid, comparable in every respect to hydrochloric acid. Hence it may be called hydrazoic acid (Stickstoff-Wasserstoffsäure).

The gas is easily absorbed by water. On distilling this aqueous solution, a very concentrated aqueous acid passes over between 90° and 100° C. The first distillates of this contained about 27 per cent. hydrazoic acid. The aqueous solution, if not too dilute, has the odor of the gas. Blue litmus paper is colored intensely red when held above the liquid. Ammonia gas produces dense fumes of ammonium azide. A seven per cent. aqueous solution of hydrazoic acid dissolves iron, zinc, copper, aluminium, and magnesium, hydrogen being liberated violently. It seems that the concentrated acid also attacks gold and silver, since it turns red when in contact with both these metals.

The nitrogen metals (azides) thus formed, comparable are in every way to the metallic chlorides.

The metals of silver nitrate and mercurous nitrate are precipitated, even from dilute solutions, quantitatively as $N_3 Ag$ and $(N_3)_2 Hg_2$. These reactions are used for the separation and purification of hydrazoic acid. Dilute sulphuric acid decomposes the solutions of all nitrogen metals, setting free the acid.

Silver azide was more closely studied. It differs from silver chloride only by its prominence under the influence of light.

Hydrazoic acid differs from halogen hydrides merely by its strong explosive properties which necessitate great precaution in handling it. The detonation caused by a few milligrammes of

silver azide or mercurous azide when heated or struck is unparalleled. A mere accident prevented the author being hurt when trying to enclose 2 c. c. of a 27 per cent. aqueous solution of azoimide in a specimen tube. The attempt to close the capillary end by fusion resulted in strong detonation reducing the thick glass vessel to powder. The sharpness of the sound, when a mere dust particle of silver azide is heated, is only comparable to the discharge of a Leyden jar.

The author is now beginning the study of reducing agents upon a nitrosamine which he obtained from hippuric acid. If it should be feasible (contrary to all observations heretofore made on nitroso compounds) to reduce the oxygen of the nitroso group, then it will be possible to split the amidohydrazin compound obtained into hippuric acid and *triamide*: $\text{NH}_2 \cdot \text{NH} \cdot \text{NH}_2$, by boiling with acids. This triamide would be the "propane" of the hydronitrogen compounds. This body might again be condensed to substances richer in nitrogen. Introduction of nitroso groups into these, allowing a reduction to amido groups, would lead to a new chemistry of nitrogen compounds analogous to the chemistry of hydrocarbons of alcohol radicles. (*Ber. d. chem. Ges.*, **23**, 3023.)
L. H. F.

Preparation of Dry Diazo-Salts. E. KNOEVENAGEL.

Avoid water, replacing it by alcohol. Instead of working with a current of free nitrous acid, use amyl nitrite in acid solution for diazotizing.—(*Ber. d. chem. Ges.*, **23**, 2994.)
L. H. F.

Formation of Urea from Albumen. E. DRECHSEL.

It was found by Lossen that on oxydizing albumen with alkaline permanganate solution, no urea, but small quantities of guanidine were formed. The author, studying the products of decomposition of caseïne found two new bases, lysatine and lysatinine, isomeric with creatine and creatinine. From these new bases he obtained urea by further treatment with baryta water.

His researches are of importance, since they show that urea is formed from albumen, simply by hydrolysis and without any oxidation.

Lysatine has subsequently also been formed from glue, and conglutine. (*Ber. d. chem. Ges.*, **23**, 3096.)
L. H. F.

A new Photographic Process. A. G. GREEN, C. F. CROSS and E. I. BEVAN.

The diazo compounds of dihydrothiitoluidine and its condensed derivatives when combined with the substance of animal or vegetable tissue are highly sensitive to light. A cotton or silk tissue dyed with primuline (1 to 2 per cent.) and sensitized by diazotizing of this latter, represents a photographic plate, able to yield a perfect "positive" in 40 to 180 seconds exposure. Thus a perfect reproduction of the original, in the shape of diazoprimumine, takes place. This picture then may be "developed" in form of any of the different colors which are formed from the above by combination with amines or phenoles. (*Ber. d. chem. Ges.*, **23**, 3131.)

L. H. F.

On Fucose, from sea weed (Fucus), an isomer of Rhamnose. A. GÜNTHER and B. TOLLENS.

This crystallizable sugar from sea weed was obtained by the hydrazone reaction. It is very soluble, of sweet taste, crystallizes slowly, like laevulose, forms distinctly microscopic needles and plates, and has the identical composition of rhamnose: $C_6 H_{12} O_5$.

Fucose rotates strongly to the left and, in the beginning, shows multi-rotation. On distilling it with HCl drops of methyl furfural are formed. Alkaline copper solution is strongly reduced by fucose: (1 c. c. of Fehling's solution = 6 to 7 mgrms. fucose).

The melting point of its hydrazone is $+170^\circ C.$; that of the osazone, about $159^\circ C.$ Fucose is therefore isomeric, but entirely different from rhamnose. (*Ber. d. chem. Ges.*, **23**, 2585.)

L. H. F.

A Quantitative Determination of Antimony according to Marsh's Test. A. VON BYLERT.

The author refers to the paper of Knhn and Saeger (*Ber. d. chem. Ges.*, **23**, 1798), and points out that Gautier (*Bull. Soc. Chim.*, **2**, 250, 1875) founded a quantitative determination of arsenic upon Marsh's test.

In the determination of antimony, Marsh's method has been modified. Antimony was used in the form of alloys. These were dissolved in mercury and a liquid sodium amalgam, prepared by dis-

solving 5.5 grms. Na in 25 c. c. Hg, was added. Thus sodium-antimony is formed, which is decomposed by dilute sulphuric acid. Small quantities of antimony were thus determined in alloys of tin, silver, antimony.—(*Ber. d. chem. Ges.*, **23**, 2968.) L. H. F.

Experiments for quantitative determination of arsenic by Marsh's test. Behavior of arsine towards potassium hydrate. B. KUHN and O. SAEGER.

An abstract of this paper is to be found in *Jour. Amer. Chem. Soc.*, **12**, 353. In regard to the behavior of arsine towards potassium hydrate it must be stated that R. O. Doremus has drawn attention to this fact, as observed by him, long ago. See: Fresenius quantitative analysis. Allen and Johnson's Translation. John Wiley & Sons, New York, 1881, p. 782. L. H. F.

Determination of Carbon in Organic Compounds, in the Wet Way. J. MESSINGER.

In an apparatus of peculiar construction, made by Cornelius Heinz, in Aix-la-Chapelle (Aachen) the determination of carbon in organic compounds is performed by means of chromic acid and conc. sulphuric acid. (*Ber. d. chem. Ges.*, **23**, 2756.) L. H. F.

A Method for the Quantitative Determination of Camphor. F. FOERSTER.

Substances occur in the trade consisting of nitrocellulose and camphor. Both substances are very intimately combined in these horn or ivory-like masses. Such substances are decomposed by means of sodium hydrate solution and subjected to distillation. Thus the camphor is driven off. The distillate is shaken with a measured quantity of benzol, and the rotation of the solution obtained is determined.—(*Ber. d. chem. Ges.*, **23**, 2981.) L. H. F.

Volumetric Determination of Phenols. I. MESSINGER and G. VORTMANN.

In a former paper (*Ber. d. Chem. Ges.*, **22**, 2312.) the authors have described a new class of bodies formed by the reaction of iodine upon an alkaline solution of phenols. This reaction has now been developed into a mode of quantitative determination (volumetrically) of phenol, thymol, naphthol and salicylic acid. (*Ber. d. chem. Ges.*, **23**, 2753.) L. H. F.

Abstracts of American Patents Relating to Chemistry.

(From the U. S. Patent Office Gazette.)

Issued November 18, 1890.

440,639.—Blue black azo dye. R. Lanch and M. Kahn.

Violet to blue black dye stuffs, consisting of diazotized tetrazo compounds or naphthols (dioxynaphthalines), said dye stuffs being soluble in hot water and insoluble in benzine and alcohol, and having the property of dyeing cotton without a mordant.

440,752.—Apparatus for preparing extract of coffee. H. Barotte.

440,754.—Art of manufacturing illuminating gas. E. Beauharnais.

440,772.—Preparing yeast. E. Leconte.

A method of revivifying and removing the bitterness from brewers' yeast to fit the same for bread making, which consists in diluting the yeast with warm water and adding maltine or extract of malt.

440,777.—Process of obtaining oxygen. F. Salomon.

Consists in heating a mixture of a metallic oxide, such as lead monoxide or lead carbonate, and of an alkaline earth, such as lime, in a current of air, so as to cause oxygen to be absorbed, and then driving off the oxygen by a current of carbon dioxide.

440,792.—Process of making hydrogen peroxide. W. Erwin.

440,830.—Process of treating coal tar. A. L. Munson.

The tar is heated to 110° F, and thoroughly combined with a solution of zinc chloride and oil of turpentine.

440,921.—Explosive. D. Mindeleff.

Consists ethyl nitrate, methyl nitrate, nitrobenzol, methyl alcohol, pyroxyline, and nitroglycerine.

440,946.—Welding compound. T. Durrant.

Consists of borax, brick or marble dust, potassium bicarbonate, and salts of tartar.

440,950.—Apparatus for manufacturing heating or fuel gas. A. Kitson.

440,952.—Manufacture of compound aluminium plates. C. H. Land.

440,953.—Blue dye. W. Majert.

The process of preparing consists in melting alphanaphthylidis sulpho acid with caustic soda or potash, then treating the dioxynaphthaline so obtained with concentrated or fuming sulphuric acid, or sulphuric chlorhydrin, and then adding the sulpho acid of dioxynaphthaline so obtained to tetrazodiphenyl chloride in presence of sodium carbonate.

440,963.—Apparatus for extracting grease from wool. L. Pinagel.

440,968.—Carbonizing apparatus. A. Silverberg and C. Detering.

441,010.—Leather dressing. J. M. Jolly.

Consists of neat's foot oil, water, beeswax, logwood extract, gum arabic, petrolatum, borax, oil of citronella and castile soap.

441,075.—Paint. J. Smith.

Consists of white lead, linseed oil, whiting, sulphate of lime, alum, glue, driers and water.

441,076.—Apparatus for producing white sugar. C. Steffen.

441,102.—Process of reducing iron ores. H. W. Last and J. Johnson.

Iron is reduced directly from the ore, by grinding the moistened ore and carbonaceous material together into a pulverized homogeneous mass, spreading the paste thus formed in the hearth of a furnace, covering the charge with a mixture of pulverized glass and carbon, and then subjecting the mass to heat to effect the reduction.

Issued November 25, 1890.

441,163.—Non-conducting sheet or mass. H. W. Johns.

Consists of fibrous or comminuted sponge, and horn blende, mineral wool, the oxides of the metals, and the like bodies, and antiseptic or disinfecting material.

441,164.—Fireproofing compound. H. W. Johns.

Consists of borax, boric acid and zinc oxide.

441,165.—Non-conducting covering. H. W. Johns.

Composed of a major part of wood pulp mixed with infusorial earth, magnesia or like material and with straw, sponge, or like porous of fibrous material and with a layer of fireproofing material between the covering and the surface to be protected.

441,166.—Process of reducing ore. J. Johnson.

Iron is reduced direct from the ore, by charging the ore onto the hearth of a suitable furnace, subjecting it to a reducing heat, adding dampened pulverized carbonaceous material to the charge and rabbling or stirring it into the hot ore, and then subjecting the entire charge to a reducing heat.

441,174.—Process of manufacturing carburized metal. H. W. Last and J. Johnson.

Ore and carbonaceous material are reduced to a homogeneous pasty mass, which with a carbonaceous fuel is charged into a cupola furnace.

441,180.—Making peptones. V. Marcano.

Finely chopped meat is subjected to the action of a vegetable ferment until peptonization takes place, after which the peptonized meat is dissolved in water and filtered.

441,181.—Making peptonized meat. V. Marcano.

The process consists in subjecting finely chopped meat to the action of the organic vegetable ferments contained in the juice expressed from the

plants belonging to the family of *Bromeliaceas* until peptonization takes place, then evaporating and drying the liquid peptonized meat, and grinding it into powder.

441,182.—Making vegetable pepsin. V. Marcano.

The juice from *Bromeliaceous* plants is evaporated at a temperature not exceeding 45° C to a density of 40° B and precipitated with alcohol.

441,284.—Chemical feeder for filters. B. H. Coffey.

441,290.—Anti-fouling paint. M. E. Dejonge.

Consists of zinc dust suspended in a vehicle of a solution of shellac and colophony in fusel oil.

441,291.—Anti-corrosive and anti-fouling compound. M. E. Dejonge.

Consists of colophony, paraffin oil, paraffin and zinc dust.

441,292.—Anti-fouling paint. M. E. Dejonge.

Consists of paraffin, zinc dust and agalite.

441,366.—Process of hardening resins. A. Kissel.

Colophony and like inferior resins are hardened by first melting the resin with an oxide to neutralize the free resinous acid normally existing in the resin, and forming a hardened resin; second, treating the hardened resin thus formed with a soluble chemical to convert resinous acid generated or liberated in melting the resin into a soluble salt; and, lastly, separating the soluble resinolate from the hardened resin.

441,462.—Method of treating parchumentized fibre waste. J. W. Barnes.

441,501.—Process of manufacturing rubber goods. G. C. Mandleberg, H. L. Rothband and S. L. Mandleberg.

441,502.—Process of manufacturing rubber goods. G. C. Mandleberg, H. L. Rothband and S. L. Mandleberg.

441,503.—Process of manufacturing rubber goods. G. C. Mandleberg, H. L. Rothband and S. L. Mandleberg.

441,514.—Manufacture of translucent enamel. J. Valère.

Consists of minium, boric acid, zinc oxide, stannic oxide, clean sand, soda, feldspar, fluor spar, potassium carbonate, calcium carbonate, borax sodium nitrate, and a suitable flux.

W. R.