

## ABSTRACTS.

### GENERAL AND INORGANIC CHEMISTRY.

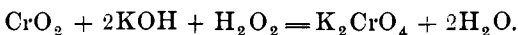
#### Action of Hydrogen Peroxide on the Oxides of Chromium. MARTINON.

The blue coloration produced by the action of hydrogen peroxide on chromic acid is attributed to perchromic acid. The reaction is thus represented :

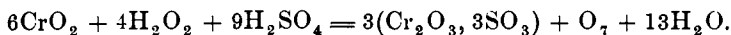


The coloration that first appears fades away, while, at the same time, oxygen is evolved and a chromic oxide remains.

Perchromic acid is then a product of addition formed by hydrogen peroxide and chromic acid, and its composition is  $\text{Cr}_2\text{O}_7\text{H}_4$ . This product is blue in the presence of acids, and red in presence of alkalis. Hydrogen peroxide, acting on the chromium binoxide, gives a chromate in the presence of an alkali.



In neutral solutions chromic acid is formed slowly. In acid liquids a chromic salt is formed :



The blue product is first produced in this reaction. With the chromium oxide in acid or neutral solution nothing is formed; in alkaline solution a chromate immediately results. (*Bul. Soc. Chim.*, 45, 862.) M. L.

#### Hydrates of Zinc Chloride. R. ENGEL.

According to M. Schindler one monohydrate only exists; its formula is  $(\text{ZnCl}_2)_2 + 3\text{H}_2\text{O}$ . According to the author at least three hydrates exist; among them two have been obtained crystallized, viz.: (a.)  $\text{ZnCl}_2 + 3\text{H}_2\text{O}$ ; obtained by maintaining at  $0^\circ$  for twenty-four hours an aqueous solution containing 70.5 per cent. of zinc chloride. (b.)  $\text{ZnCl}_2 + 2\text{H}_2\text{O}$ ; obtained on freezing a solution containing 79.9 per cent. of the zinc salt. The crystalline mass, left at  $16^\circ$ , melts slowly; the crystals not melting at this temperature are put aside. The liquid obtained corresponds almost exactly to the formula  $\text{ZnCl}_2 + 2\text{H}_2\text{O}$ ; it contains 79.07 per cent.

$\text{ZnCl}_2$ . (c.)  $(\text{ZnCl}_2)_2 + 3\text{H}_2\text{O}$ . These above mentioned crystals melt at the temperature of the hand. They can be obtained by keeping a solution of zinc chloride under a dessicator, with anhydrous  $\text{P}_2\text{O}_5$ . (*Bul. Soc. Chim.*, 45, 877.) M. L.

### On Tellurous Anhydride and Its Combinations with Acids. DANIEL KLEIN.

The author indicates some properties of this body and its preparation by decomposition of the nitrate by heat. The specific gravity of the octahedral anhydride was found to be 5.67. It volatilizes at a bright red heat. The anhydride crystallized from fusion in long needles; the angles between two groups are nearly  $90^\circ$ . The specific gravity of this modification is 5.915. Potassium hecatellurite —  $6\text{TeO}_2, \text{K}_2\text{O} + 2\text{Aq}$ . — is described. The solution of tellurous acid in phosphoric acid yields a light, white powder of no definite composition; on the double tartrate of potassium and telluryl,  $(\text{C}_4\text{H}_4\text{O}_6)_2 \text{K}_2\text{TeO}$ ; on the double corresponding salt of sodium,  $(\text{C}_4\text{H}_4\text{O}_6)_2 \text{Na}_2\text{TeO} + 2\text{Aq}$ .; of lithium, the double citrate of potassium and telluryl,  $(\text{C}_6\text{H}_5\text{O}_7)_2 \text{K}_2 \text{TeO}, \text{H}_2$ ; on the double tartrate of barium and telluryl,  $(\text{C}_4\text{H}_4\text{O}_6)_2 \text{BaO TeO}$ . (*Bul. Soc. Chim.*, 45, 714.) M. L.

### Variations of Solubility of Some Chlorides in Presence of Hydrochloric Acid. R. ENGEL.

The result of the experiments upon the variations of solubility of the salts of HCl in water at  $0^\circ$ , with increased additions of HCl, lead the author to the following approximate law: The solubility of a chloride, precipitated by HCl from aqueous solution, decreases in presence of this acid in the ratio of very nearly one equivalent of the chloride for each equivalent of acid added.

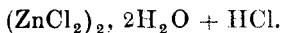
The author gives some illustrations based upon sodium chloride, barium chloride, ammonium chloride and strontium chloride. (*Bul. Soc. Chim.*, 45, 653.) M. L.

### Combinations of Zinc Chloride with HCl. R. ENGEL.

The author had foreseen the existence of one or several chlorhydrates of zinc chloride, stable at the ordinary temperature.

He passes dry HCl at the ordinary temperature into zinc chloride, adding metallic zinc from time to time. When the sp. gr.

at 25° C. reaches 2, crystals begin to appear, and in one experiment the liquid had the composition HCl, 10.3 per cent.; ZnCl<sub>2</sub>, 66.3 per cent.; H<sub>2</sub>O, 23.4 per cent. The liquid cooled, after filtration on silk, gives rhombohedra, with the composition,



The mother liquor, treated by HCl, gives first the above salt; then, when saturated with the acid and cooled, it yields crystals of the composition ZnCl<sub>2</sub> + 2H<sub>2</sub>O + HCl.

This last body is stable at the ordinary temperature and pressure. In dry vacuum it loses HCl and H<sub>2</sub>O and approximates the composition of ZnCl<sub>2</sub>; at 100° it loses HCl and ZnCl<sub>2</sub> suspended in a solution of ZnCl<sub>2</sub> remains. (*Bul. Soc. Chim.*, **45**, 656.) M. L.

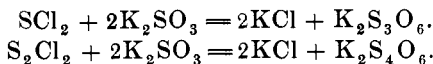
### On a Basic Copper Arseniate. COLORIANO.

The author describes the conditions of formation of this salt; the salt obtained was found to be anhydrous. Analysis leads to the formula: As<sub>2</sub>O<sub>5</sub>, 3CuO.

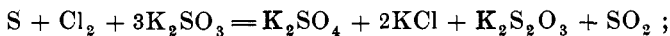
A natural hydrated copper arseniate (aphanese) was also examined. It loses a part of its water only at 290°, but all in boiling sulphur. The analysis gave: CuO = 62.47; As<sub>2</sub>O<sub>5</sub> = 30.98; H<sub>2</sub>O = 6.62, corresponding to the formula As<sub>2</sub>O<sub>5</sub>, 6CuO, 3H<sub>2</sub>O. (*Bul. Soc. Chim.*, **45**, 707.) M. L.

### On the Relative Activity of the Halogenic Derivatives of Sulphur. W. SPRING and A. LECRENIER.

The authors have considered the so-called combinations of I, Cl and Br as alloys; that is, as definite combinations which play the rôle of solvent for the excess of one or the other halogen. They base their conclusion on this fact, studied by one of them, that the chloride of sulphur reacted easily on potassium sulphite, and gave trithionate or tetrathionate.



If the chlorine and sulphur were not combined the reaction would be:



that is to say, that as many molecules of potassium sulphate are produced as there are molecules of free chlorine present.

The authors have applied the same reactions to the study of I and Br, and their conclusions are :

1. For chlorides and bromides of sulphur the quantity of free chlorine or bromine is greater in proportion as the composition is further removed from  $S_2Cl_2$ , or  $S_2Br_2$ ; as to the iodo-derivatives, no conclusion could be established.

2. In considering the uncombined proportions for the bodies  $S_2Cl_2$ ,  $S_2Br_2$ ,  $S_2I_2$ , they arrive at the figures :  $S_2Cl_2$ , 93.18;  $S_2Br_2$ , 72.89;  $S_2I_2$ , 9.88. These numbers would show that the affinity of chlorine for sulphur is 9.43 times, and that of bromine 7.37 times greater than the affinity of iodine.

3. The haloid derivatives studied can in no way be compared to alloys. The decomposition of iodides, for instance, is complete when, on account of the evaporation, the tension of iodine decreases continually. These derivatives belong rather to the class to which hydrate of chlorine or ammoniacal chlorides of silver belong, than to the true alloys. (*Bul. Soc. Chim.*, 45, 867.) M. L.

**Researches on a few Crystallized Arseniates. COLORIANO.**

The author prepares the zinc salt by the action of metallic zinc on a solution of arsenic acid and of boiling water on the jelly-like substance obtained. The result is perfectly crystalline. This salt loses its water at 170° C.

Its composition is  $(As_2O_5, 2ZnO, 3H_2O)$ .

$H_2O$ .....	11.99	12.03	12.10
$ZnO$ .....	36.57	36.65	36.32
$As_2O_5$ .....	51.44	51.32	51.57

On treating with boiling water the body obtained by M. Demel by digesting zinc carbonate with arsenic acid, the author obtains a body of the composition :  $As_2O_5, 4ZnO, H_2O$ . By digesting arsenic acid with manganous carbonate he obtains a jelly-like body which boiling water converts rapidly into a crystalline substance having the composition :  $As_2O_5, 2MnO, 3H_2O$ .

By the action of boiling water this salt loses acid and is converted into the body :  $(As_2O_5)_2, 5MnO, 5H_2O$ ; but in a sealed tube the body obtained is of the composition :  $(As_2O_5), 5MnO, 2H_2O$ .

The author has studied the effect of boiling water on the salt prepared by Debray by the digestion with water, at 70°, of the liquid resulting from the action of arsenic acid on copper carbonate. He finds that this compound, which crystallizes in light-blue tables, is changed by boiling water into octahedra of an olive color, and similar to the mineral olivenite. Analysis indicates for this salt the formula:  $\text{As}_2\text{O}_5 \cdot 4\text{CuO} \cdot \text{H}_2\text{O}$ . (*Bul. Soc. Chim.*, 45, 709.) M. L.

## ORGANIC CHEMISTRY.

### Action of Alcoholic Potash on Urea, Sulpho-Urea and Substituted Ureas. A. HALLER.

Two or 2.5 grammes of the substance are heated on the water bath for twelve hours, with the theoretical quantity of potash and 20 grammes absolute alcohol.

*Urea*.—This substance is converted into potassium cyanate, ammonia and water.



*Monoethylurea*.—Obtained from ethyl isocyanate and ammonia, and by decomposing sulphate of monoethylamine with potassium cyanate.



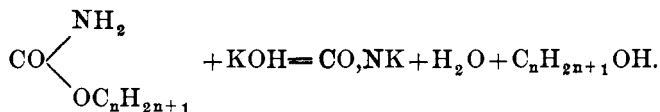
*Non-Symmetric Diethylurea*.—Yields potassium cyanate and diethylamine.

*Sulpho-Urea*.—According to Volhard this urea, heated to 160–170°, yields ammonium sulphocyanate. The equation is more complicated below 100°, etc. (*Bul. Soc. Chim.*, 45, 707.) M. L.

### On Two Properties of Urethanes of the Fatty Series. G. ARTH.

The action of an alcoholic potash solution on carbonate of ethyl and on the isobutylic, amylic and caprylic ethers are studied. All of these compounds, similarly treated, yield potassium cyanate and

the alcohol is regenerated. The general equation of decomposition of the carbonic ethers is then :



Having prepared octyl carbonate by the action of cyanogen chloride on caprylic acid the ether, heated at 230–232°, was found to yield cyanuric acid, whereas the carbonic ethers of the lower saturated alcohols of the fatty series distil without alteration. (*Bul. Soc. Chim.*, **45**, 702.) M. L.

### On the Direct Chlorination of Methylbenzoyl. H. GAUTIER.

When a stream of chlorine is passed through methylbenzoyl the green color of chlorine disappears rapidly at the beginning of the operation, then the reaction becomes slower. The product obtained is distilled and the portion passing between 240–250° is set aside. This product contains 37.56 per cent. Cl; but, distilled again, it gives for the several fractions bodies containing 39.85 per cent. Cl, 39.88 per cent. Cl, 45.38 per cent. Cl, 45.48 per cent. Cl. These experiments show that the product, boiling at 240°–250°, is a mixture of methylbenzoyls, mono-, bi- and trichlorinated, all containing Cl in the chain, as oxidation converts them all into benzoic acid, melting at 121°.

The author thinks from his experiments that chlorine, after substituting itself in succession for the three hydrogen atoms of the methyl groups, would then replace the H of the benzene nucleus. (*Bul. Soc. Chim.*, **45**, 875.) M. L.

### Presence of Alkaloids in Old Flours. M. BALLAND.

The flour, undried, is treated with ether at 62°. The residue, after the evaporation, is treated with hot water. The cool solution, treated by the appropriate reagents for alkaloids, shows them very distinctly. These facts seem to explain some accidents hitherto attributed to improper manipulation of bread. The author thinks that the alkaloids are produced by a transformation of the gluten, under the influence of the natural ferment of wheat. (*Arch. de Pharm.*, **1**, 251.) M. L.

**Abstracts of American Patents Relating to Chemistry.**

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

(May 11th, 1886.)

- 341,506.**—Apparatus for manufacturing gas.
- 341,576.**—Mixed paint. J. H. Hollen.  
Consists of bleached gum shellac, corn starch, magnesia and steatite.
- 341,578.**—Apparatus for concentrating ammoniacal liquor. C. W. Isbell.
- 341,624.**—Apparatus for manufacturing illuminating gas. J. B. Archer.  
*Brief.*—Steam is first superheated in a coil embedded in an annular iron jacket, and then there is mixed with it about two-thirds of the oil to be vaporized, and then the superheated steam and oil are intermixed and subjected to heat in a mixing chamber, then the remaining one-third of oil is added, and the mixture is subjected to heat in a coil embedded in an iron jacket and converted into a fixed gas. The fixing coil of pipe is composed of an inner and outer coil, one within the other, and the gas is first passed through the inner coil, and escapes from the open end thereof into the outer coil, from which it passes into an annular retort and passes therefrom to the holder or place of use, part of it being supplied to the burner under the retort.
- 341,625.**—Combined gas and steam generator. J. B. Archer.
- 341,627.**—Apparatus for generating gas or vapor. J. B. Archer.
- 341,629.**—Apparatus for generating vapor or gas. J. B. Archer.
- 341,651.**—Filtering material. C. G. Gilman.  
Consists of porous terra cotta combined with charcoal.
- 341,669.**—Process of and apparatus for evaporating sugar solution. S. M. Lillie.
- 341,672.**—Apparatus for purifying water. J. B. McCormack.
- 341,686.**—Fluid for removing boiler scale. J. N. Pirrong.  
Consists of water, scrap leathers, caustic soda, sal soda, alum, ammonium sulphate and carbolic acid.
- 341,759.**—Method of preparing cocoa. P. Lobeck.  
Cocoa beans are roasted, peeled and ground, and then subjected to heat and pressure to express the cocoa butter. The cocoa is then placed in a closed vessel and subjected to the action of steam at a high temperature and pressure to convert the albuminoids and starch into soluble compounds. The mass is finally dried and pulverized.
- 341,760.**—Mixed paint. G. W. L. Marsden.  
Consists of red or white lead, mineral fiber, hydraulic cement and rosin.

**341,761.**—Dry paint composition. G. W. L. Marsden.  
Consists of red or white lead and mineral wool.

**341,784.**—Flux for welding. E. A. Whitcomb and J. J. Riddle.  
Is composed of calcium fluoride, sodium carbonate, and calcium sulphate.

**341,785.**—Welding flux. E. A. Whitcomb and J. J. Riddle.  
Consists of calcium fluoride and calcium sulphate.

**341,848.**—Evaporating apparatus for saccharine and other juices. J. Guardialo.

**341,853.**—Purifying potable and other waters. F. M. Lyte.  
Sewage and foul or impure waters are clarified and deodorized by the production of aluminium hydrate in the liquid, from sodium or other soluble aluminate and an acid aluminium salt.

(*May 18th, 1886.*)

**341,991.**—Production of yellow azo-coloring matter. F. Bender.  
The yellow coloring matter is produced by the action of diazometanitriline, or its sulpho-acids upon phenylene diamine.

**342,066.**—Iron coated fire brick. J. P. Comins.

**342,207.**—Coloring compound. A. Mueller Jacobs.  
Consists of the resinates of a metal or alkaline earth and a coloring matter.

**342,208.**—Manufacture of zylonite and other pyroxiline compounds and articles made therefrom. J. G. Jarvis.

Camphor is dissolved in any solvent, which is not a solvent of pyroxilin, and mixed with pulverized pyroxilin.

**342,231.**—Disinfectant. M. Souvielle.  
Consists of essence of tar, dialyzed iron and sulphur.

**342,237.**—Process of obtaining ammonia. J. Van Ruymbeke.  
Liquids containing organic substances in solution are showered through forced currents of air, over porous substances saturated with putrid ferments.

**342,238.**—Process of making a fertilizer from tank waste. J. Van Ruymbeke.

The tank wastes of rendering and slaughtering houses are evaporated to about twenty per cent. of moisture, and then distilled at a temperature of about 250° C.

**342,279.**—Composition for removing ink. A. Buchten.  
Consists of water, citric acid, borax and calcium hypochlorite.



(*May 25th, 1886.*)

- 342,432.**—Blue coloring matter from nitrophenetol. C. Duisberg.  
Produced by the action of tetrazodiphenoldiethylic ether upon betanaphthylamine-monosulpho-acid.
- 342,448.**—Process of treating vegetable fibrous substances. W. Marr.
- 342,500.**—Apparatus for distilling hydrocarbon oils. R. Dean.
- 342,548.**—Process of depositing solid particles contained in air or gas. A. O. Walker.
- 342,564.**—Process of refining crude petroleum oil. G. L. Benton.
- 342,565.**—Apparatus for refining crude petroleum. G. L. Benton.
- 342,574.**—Dietetic compound. J. Carnrick.  
Consists of meat, gluten, or wheat and milk.
- 342,575.**—Dietetic compound. J. Carnrick.  
Peptonized compound consisting of meat, gluten or wheat and milk.
- 342,578.**—Manufacture of bichromate of soda. W. J. Chrystal.  
The chrome ore is furnaced with lime and a soda salt in the usual way, and the resulting product is lixiviated with an acidified solution of a soda salt. The solution is treated with an acid to convert the neutral into the acid chromate.
- 342,599.**—Process of making neutral aluminous compounds. F. P. Harned.
- 342,607.**—Process of dioxidizing and reducing iron ores by means of natural gas. E. D. Kendall.
- 342,646.**—Manufacture of bichromate of potash. W. Simon.  
Sodium bichromate is decomposed by potassium chloride.
- 342,646.**—Process of manufacturing ammonium bichromate. W. Simon.  
Sodium bichromate is converted into ammonium sodium chromate, and this salt is decomposed into sodium chloride and ammonium bichromate by the addition of hydrochloric acid.
- 342,692.**—Method of treating cottonseed oil. J. B. Grant and A. Mason.
- 342,722.**—Process of and apparatus for distilling ammonia. W. C. Wren.

(*June 1st, 1886.*)

- 342,784.**—Manufacture of cement. U. Cummings.  
Consists in calcining a mixture of clay and calcium sulphate.
- 342,784.**—Manufacture of sulphuric acid. U. Cummings.  
Consists in calcining a mixture of clay and calcium sulphate, and recovering the sulphuric acid which is driven off.
- 342,897.**—Manufacture of sodium and potassium. H. Y. Castner.

(June 15th, 1886.)

**343,589.**—Process of reducing refractory silver and gold bearing ores. G. T. Lewis.

**343,590.**—Producing solid compounds resembling vulcanite from hair, etc. O. Lugo.

Hair is subjected to heat and pressure.

**343,591.**—Vulcanite and process of producing the same. O. Lugo.

A mixture of hair or horny material, with India rubber or other vulcanizable material and sulphur is subjected to heat and pressure.

**343,595.**—Process of hopping and preserving beer with carbonic acid gas. D. Morris, T. Morris and C. A. Kern.

Carbon dioxide previously passed through an infusion of hops is forced into casks of beer.

**343,651.**—Vitrified asbestos. E. A. Sperry.

Asbestos sheets or fabrics are immersed in a solution of sodium or potassium silicate, and dried.

**343,666.**—Apparatus for drying bone black in sugar refineries. S. M. Lillie.

**343,673.**—Ammonia soda process. E. W. Parnell and J. Simpson.

The process consists in mixing the sodium chloride produced in the ammonia alkali process with the waste or waste drainage of the Le Blanc process, and subsequently employing the ammonium sulphide so produced, for admixture with the sodium chloride solution in the ammonia alkali process, and collecting and utilizing the hydrogen sulphide produced in the reactions.

**343,674.**—Process of treating ammonium sulphide to obtain hydrogen sulphide. E. W. Parnell and J. Simpson.

The ammonium sulphide solution is heated with ammonium sesquicarbonate.

**343,674.**—Recovery of ammonia in ammonia-soda manufacture. E. W. Parnell and J. Simpson.

Ammonium sulphide is decomposed by ammonium bisulphate.

**343,695.**—Manufacture of artificial stone and marble. L. L. Boblett.

**343,731.**—Furnace for roasting and chloridizing ores. L. M. Rumsey.

**343,793.**—Dyeing cotton fibre. O. Bielschowski.

The fabric is suspended in a solution of  $\alpha$ -naphthylamine, to which an oxidizing solution is added, to develop the color on the fabric.

**343,850.**—Art of making nitrocellulose. F. V. Pool.

The spent acids are restored and purified by adding thereto a suitable quantity of a nitrate which is decomposed in the mixture, the liberated nitric acid serving to strengthen the bath, while the base of the nitrate forms with the sulphuric acid present a compound insoluble in the mixture.

**343,860.**—Freezing mixture. F. A. Schwill.

Consists of ice, salt ammonium nitrate and magnesium chloride.

**343,896.**—Treating and bleaching rattan. H. Endemann.

The enamel or silica is first removed by the action of a solution of soap, after which it is bleached by an oxidizing agent.

**343,897.**—Treating and bleaching rattan. H. Endemann.

The enamel or silica is removed by the action of a solution of soap, after which it is bleached by a reducing agent.

**343,906.**—Fire proof paint compound. W. H. Keller.

**343,913.**—Process of manufacturing hydraulic cement. H. C. Millen and D. Millen.

**343,952.**—Treating rattan. H. Endemann.

The silica or enamel is removed by heating in a solution of an alkaline amido-soap.

**343,973.**—Process of treating wine. A. Wehrle.

W. R.