

## XXXVII.—ON THE EFFECT OF CHANGE OF DENSITY IN ALUM PURPURINE SOLUTIONS ON THE ABSORPTION BANDS.

(Abstract of a Paper read before the AMERICAN CHEMICAL SOCIETY, Sept. 9th, 1880.)

BY HENRY MORTON, PH.D.

The phenomenon noticed in this paper was the displacement of the maxima of absorption in solutions of purpurine in alum-water.

- 1st. With changes in amount of alum.
- 2d. With changes in temperature.
- 3d. With change in the alum salt used, *i. e.*, ammonia, potash or soda alum, or sulphate of alumina.

The character of these changes was as follows :

Greater amount of "alum" in the solution carried the maxima downwards in the spectrum.

A higher temperature likewise had the same effect, as also had a greater molecular weight in the alum salt employed.

These results are in remarkable accordance with those noticed by the writer in the salts of uranium.\*

### Abstracts from American and Foreign Journals.

### Bulletin de la Société Chimique de Paris

Abstractor, E. H. S. BAILEY, Ph.B.

*On Persulphuric Acid; its Formation by Electrolysis*, BERTHELOT (33, 242).—A further study of this acid, discovered in 1878 by the author. It is formed by electrolysis by placing dilute sulphuric acid in a porous vessel, which in turn is surrounded by another vessel containing the same liquid. The whole is kept cool by a serpentine coil, through which water flows. Platinum electrodes are employed, and a current from 6 or 9 Bunsen cells. The persulphuric acid is formed at the positive pole. Water passes through the porous cup more rapidly than the acid. At a later stage of the operation, as the acid becomes more concentrated, and hence presents greater resistance, it seems to be acted upon by the electric current, forming hydric peroxide. The fact that this latter gradually disappears may probably be accounted for by the well-known action of concentrated sulphuric acid upon it.

\* See *Chemical News*, 28, 47, 113, 164, 233, 244, 257, 268.

**On the Heat of Formation of Persulphuric Acid**, BERTHELOT (33, 246).—The heat of formation is measured by diluting the liquids obtained by electrolysis with 15 or 20 volumes of water, and treating them successively with a solution of iodide of potassium, and sulphurous acid. A check experiment, made under the same conditions by mixing solutions of iodide of potassium and sulphuric acid of corresponding strength, furnishes data for the complete explanation of the reaction:  $S_2O_7$  (dilute) +  $SO_2$  (dilute) +  $3HO = 3(SO_3HO)$  (dilute). The heat of formation is found to be 13.8 cal.

The formation of hydric peroxide, of persulphuric acid and of ozone, constitutes a gradual series, thus :

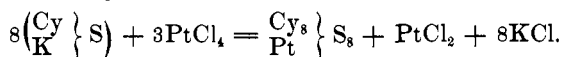
Ozone  $O + O = (O_2)$  absorbs.....14.8 cal.

Persulphuric Acid  $S_2O_6 + O = (S_2O_7)$  absorbs.....13.8 cal.

Hydric Peroxide  $HO + O = (HO_2)$  absorbs.....10.8 cal

These three bodies are mutually transformable into each other in accordance with certain relations that the author has developed. All contain active oxygen in a condition to be readily given up to oxidizable bodies.

**On a new Sulphocyanate of Platinum**, VINCENTE MARCANO (33, 250).—By mixing bichloride of platinum and sulphocyanate of potassium, it is possible to obtain, upon cooling, crystals having a composition corresponding to the formula:  $\left. \begin{matrix} Cy_8 \\ Pt \end{matrix} \right\} S_8 + 2H_2O$ ; the reaction can be expressed thus :



The crystals belong to the monoclinic system. The angle of the oblique rhomboidal prism measures  $114^\circ 25'$ ; inclination of axes  $80^\circ 46'$ . This body is a new proof of the octatomicity of platinum.

**Reactions of Tetrachloride of Titanium, Stannic Chloride and Antimonic Chloride upon Acetic Acid and Acetic Anhydride**, A. BERTRAND (33, 252).—Messrs. Friedel and Ladenburg (*Ann. de Chim. et de Phys.*, [4 series,] 27, 428) have made a mixed silico-acetic anhydride, by acting upon chloride of silicon with crystallizable acetic acid, or with acetic anhydride. The author notices that tetrachloride of titanium, stannic chloride and antimonic chloride have the same action as chloride of silicon with crystallizable acetic acid; hydrochloric acid is formed, but with the anhydride, chloride of acetyl.

*On Inactive Glucose, or Neutral Sugar*, U. GAYON (33, 253).—In discussing the results obtained by M. Horsin-Déon (reviewed in this JOURNAL, I, 488) the author claims to have arrived at similar results earlier, and by a different method.

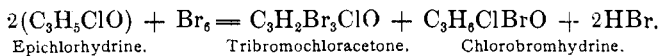
1st. Neutral and inverted sugar have the same composition.

2d. The formation of neutral sugar precedes that of inverted sugar.

From the results of experiments, the presence of inactive glucose in raw sugar and molasses can be accounted for. All raw sugars contain a variety of organisms capable of secreting an inverting ferment, which develops with the greatest rapidity in those sugars containing the most coloring and organic matter. Heat and moisture favor their multiplication, and the transformation of the sugar. Inactive glucose is at first formed when the organisms multiply very rapidly; sometimes the inactive glucose is mixed with a little true inverted sugar.

*On Neutral Sugar and Inverted Sugar*, P. HORSIN-DÉON (33, 256).—A review of the results arrived at by different experimenters when sugar is inverted; the first form that it takes is that of neutral sugar. The sugar remains neutral if the inversion has taken place in the presence of a little moisture, but it becomes levogyric, taking the rotary power of normal inverted sugar, when considerable water is present.

*Action of Bromine upon Epichlorhydrine*, E. GRIMAUX and P. ADAM (33, 257).—Bromine readily attacks epichlorhydrine at 100°. By cooling the product of the reaction a crystalline mass separates from a heavy oil. The crystals consist of hydrate of tribromochloracetone, which is readily dehydrated on exposure to air and becomes  $C_3H_2ClBr_3O$ , a colorless oily liquid. The heavy oil which separates from the crystals above mentioned appears to be chlorobromhydrine. The reaction which takes place is similar to that of bromine upon dichlorhydrine. A substitution product is at first formed, and the hydrobromic acid produced unites with epichlorhydrine changing it to chlorobromhydrine, which is in turn attacked by bromine. The reaction is—



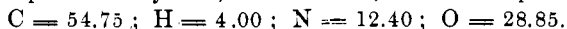
Epichlorhydrine.

Tribromochloracetone.

Chlorobromhydrine.

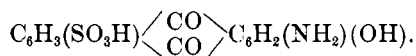
*On the Determination of Glycerine in Wine*, HIP. RAYNAUD (33, 259).

**Synthesis of Ulmic Bodies**, A. MILLOT (33, 262).—By passing an electric current through a dilute ammoniacal solution, using for the positive pole a plate of gas carbon, some of the carbon is dissolved producing a black coloration, and this black coloring matter is precipitated by a mineral acid. This is soluble in water, especially if warm, but is precipitated by alcohol. Although containing nitrogen it gives off no ammonia upon boiling with potassic hydrate. The precipitate produced by HCl, dried at 150°, has the composition:



If a caustic potash solution is used instead of ammonia, a similar result is obtained, except that it is free from nitrogen.

**Action of Ammonia upon Anthraquinonesulphonic Acid**, R. BOURCART (33, 263).—A discussion of the properties of amidanthraquinone, in regard to the "action of ammonia upon  $\beta$ -anthraquinonedisulphonic acid." It is ascertained that if the sodium salt be treated at 180°, with aqua ammonia in sealed tubes, a substance is produced which is precipitated in whitish flakes when the solution is neutralized. The acid has the formula:



The ammonia salt, which crystallizes from dilute alcohol, has the symbol:  $C_6H_3(SO_3NH_4) \left\langle \begin{array}{c} CO \\ CO \end{array} \right\rangle C_6H_2(NH_2)(OH) + 2\frac{1}{2}H_2O$ .

**On the Decomposition of Hydric Peroxide in the Presence of Alkalies, and on the Derivatives of Baric Binoxide**, BERTHELOT (33, 289).—M. Schöne (*Annalen der Chemie u. Pharm.*, 192, 257, 1878) has discovered that there are definite combinations of baric binoxide and hydric peroxide; the author has measured the heat of formation of the different compounds. In regard to the decomposition of hydric peroxide in the presence of an alkali, the theory advanced is that a certain proportion of the former unites at first with the alkali, heat being disengaged:  $2HO_2 + BaOHO = BaO_2HO_2 + 2HO$ . This compound is then changed into hydrate of the binoxide, and loses half of its oxygen, heat being again disengaged:  $BaO_2HO_2 = BaO_2HO + O$ . The hydrate of the binoxide in turn becomes hydrate of protoxide, its excess of oxygen being displaced by water, and more heat being evolved:  $BaO_2HO = BaOHO + O$ . Another portion of hydric peroxide is then attacked, and so on, till it is entirely decomposed.

**Analysis of the Waters of the Bourboule**, ED. WILLM (33, 292).—Waters from different sources were analyzed. It is a noteworthy fact that the arsenic is nearly all found in the soluble part of

the residue, from which it is inferred that it exists in the form of an alkaline arseniate. The quantity of trisodic arseniate varies from 5.1 to 17.2 mgrms per liter. Bicarbonate of lithium is also present in quantities from 37.9 to 44.3 mgrms per liter.

*On the Action of Bromine upon Diphenylmethane*, C. FRIEDEL and M. BALSCHN (33, 337).—The object of these investigations is to ascertain whether bromine can be substituted in the place of the hydrogen of the non-aromatic part of the radical. By acting upon one molecule of diphenylmethane with two molecules of bromine under appropriate conditions, bibromo-diphenylmethane may be formed. This when heated with water is decomposed into benzophenone and hydrobromic acid. If one molecule of bromine is used instead of two, monobromodiphenylmethane is formed. The alcoholic solution of the latter acted upon by alcoholic potassa forms mixed ethylbenzohydrolic ether. By treating with amyl alcohol instead of ethylic, and potash, amylbenzohydrolic ether is produced, or if potassic acetate and acetic acid are used we obtain acetate of benzohydrole. Benzohydrolic ether and benzohydrole can also be made from the monobromodiphenylmethane.

*On the Constitution of the Salts of Rosaniline and of Analogous Coloring Matters*, A. ROSENSTIEHL (33, 342).

*On a Continuous Method for the Preparation of Acetic Ether*, J. A. PABST (33, 350).—Acetic ether can be made by a process similar to that employed for the manufacture of sulphuric ether. The mixture of alcohol, sulphuric acid and acetic acid which is in the apparatus, gives off at first a little sulphuric ether, but afterwards at 130°–135°, acetic ether of 85%. This is washed with a saturated solution of chloride of calcium, dried over chloride of calcium, and redistilled.

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## Berichte der Deutschen Chemischen Gesellschaft.

Abstractor, H. ENDEMANN, Ph.D.

*Phenylactic Acids*, EMIL ERLLENMEYER (13, 303).

*Phenylbromlactic Acid*, EMIL ERLLENMEYER (13, 305).

*Orthonitrobenzaldehyde and its Behavior towards Nascent Hydrogen*, CH. RUDOLPH.—Tin and glacial acetic acid produce with orthonitrobenzaldehyde a substance of basic character,  $C_7H_5N$ . The same, with tin and hydrochloric acid, produces  $C_7H_4ClN$ . The same reaction was to be employed for other orthonitroaldehydes, the authors intending to first submit the aldehydes of orthonitro-