

ABSTRACTS.

Arseniomolybdic Acid. O. PUFÄHL.

Barium molybdate, when suspended in an aqueous solution of arsenic acid and decomposed with the equivalent amount of H_2SO_4 , yields a yellow solution, which on concentration deposits crystals of arseniomolybdic acid. Crystallizing in orange red doubly-refracting needles not affected by the atmosphere. (*Ber. d. ch. Ges.*, 213, 1884.)

J. H. S., JR.

Chemical Action with Carbon and its Compounds. G. GORE.

A series of 44 experiments in which the attempt is made, through a variety of reactions, to separate carbon in the elementary state, and to discover new facts in regard to carbon and some of its compounds. (*Chem. News L.* 125.)

A. A. B.

On the connection between Pseudo Solution and True Solution. W. W. J. NICHOL.

The well known Brownian motion of small particles suspended in a liquid being regarded as a consequence of molecular impacts, is applied by the author to support the *molecular* as distinguished *hydrate* theory of solution. According to the former theory, the solution of a salt in water is a consequence of the superior attraction of the molecules of water for those of the salt as compared with the cohesion of the salt itself. Substances are soluble in inverse proportion to their cohesion. Cohesion being destroyed by subdivision, a finely divided substance remains suspended for a long time in water. Such suspension or *pseudo solution* differs only from true solution in respect to fineness of division of the solid. If subdivision could be carried to the isolation of the molecules, true solution would result, and substances thus dissolved, could separate from solution only slowly in spite of the superior cohesion of their molecules, because aggregations of these molecules sufficiently large to separate themselves from solution could only occasionally be found. As an instance of this we have slow precipitation of many insoluble substances from solution when cold and dilute. (*Chem. News L.* 124.)

A. A. B.

On Pyridine-Carbo-Acids. E. NÖLTING and A. COLLIN.

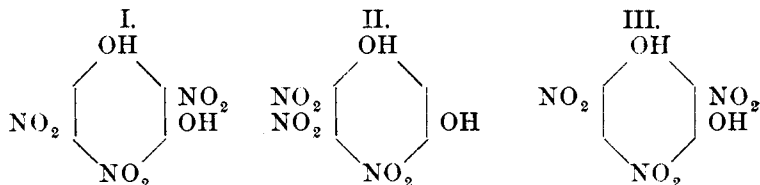
I. The pyridinecarbo-acid, which is obtained from chinoline by oxidizing with potassium permanganate, has both its carboxyl-groups in the ortho-position. It may therefore be looked upon as a phthalic acid, in which a CH group has been replaced by a nitrogen atom.

II. ON THE FORMATION OF BLUE FROM ROSANILINE.

It is known that when aniline, orthotoluidine, or paratoluidine are treated to 180° C. with rosaniline and benzoic acid, a blue dyestuff is formed. Metatoluidine acts similarly. (*Ber. d. ch. Ges.*, 258 1884,).
J. H. S., JR.

On the Constitution of Styphnic Acid. E. NÖLTING and A. COLLIN.

Styphnic acid, or trinitroresorcine, can have only one of the three following constitutional formulæ, viz.:



Bantlin, who obtained it from metanitrophenole, gives it the formula indicated under I. In I. as well as in II., two of the nitro-groups hold symmetrical positions in relation to one another, and according to Laubenheimer's rule, should, when heated with alkalis, be split off as nitrites.

III. if converted into the corresponding ether, and then treated with alkalis, would split up into styphnic acid. The authors conclude that styphnic acid is constituted as represented under formula III. (*Ber. d. ch. Ges.*, 281, 1884.)
J. H. S., JR.

On Nitrosophenoles. H. GOLDSCHMIDT.

In a previous article the author described certain compounds produced by the action of hydroxylamine on diketones and chinones. This article is a continuation of the previous one, and describes the behavior of benzochinone and β -naphthochinone towards hydroxylamine. 1 part chinone was dissolved in 300 parts

H₂O, and to this was added an aqueous solution of hydroxylamine chloride. The mixture was now allowed to rest for 12 hours until the smell of chinone had disappeared. It was then shaken up with bone black, filtered, and extracted with ether. After concentrating the solution in vacuo, long, colorless needles were obtained, which on analysis were found to be benzochinoneoxim. β-naphthochinone and hydroxylamine chloride yielded β-naphthochinoneoxim. (*Ber. d. ch. Ges.*, 210, 1884.) J. H. S., JR.

On the Separation of Zinc and Nickel. T. MOORE.

Evaporates to reduce excess of acid, dissolves residue in 20–25 c. c. of water, precipitates with excess of ammonium sulphide, dissolves precipitate in solution of KCN, with aid of heat, and dilutes to 250 c. c.; then adds a few c. c. of sodium acetate solution, acidifies with acetic acid and heats to boiling. ZnS separates; it is allowed to stand several hours, then washed by decantation with hot water containing a little sodium acetate and H₂S; the precipitate is weighed after conversion to ZnO. Filtrate and washings are evaporated to dryness with aqua regia, the residue is dissolved, and the solution precipitated with KHO and Br. The precipitate is finally dissolved in H₂SO₄, and after addition of NH₄HO, Ni is precipitated by the battery. Results very accurate and process rapid. (*Chem. News L.* 157.) A. A. B.

A New Test for Nitrous Acid. RAPHAEL MELDOLA.

Para-amidodimethylaniline, on being treated with nitrous acid, is converted into the diazo-compound—C₆H₄.N $\left\{ \begin{array}{l} \text{N}=\text{N}-\text{R}. \\ \text{N}=\text{N}-\text{C}_6\text{H}_4\text{N} \\ \text{(CH}_3\text{)}_2. \end{array} \right.$

The tetrazo-salt C₆H₄ $\left\{ \begin{array}{l} \text{N}_2\cdot\text{Cl}. \\ \text{N}_2\text{C}_6\text{H}_4\text{N}(\text{CH}_3)_2 \end{array} \right\}$ possesses the re-

markable property of assuming a deep blue coloration when its dilute aqueous solution is exposed to the air; this property makes it valuable as a test for nitrous acid.

In order to prepare the substance, paranitraniline is diazotized in the usual manner, and combined with the theoretical amount of dimethylaniline. The crystalline precipitate formed is collected on a filter, washed and reduced with ammonium sulphide. The

reduction product is poured into cold water, which, after a while causes the basic matter to separate. This is collected on a filter, washed and dissolved in dilute HCl, in the proportion 0.5 grm. to 1 litre. This solution has a deep red color.

If a solution is to be tested for nitrous acid, add a few drops of the coloring matter to it, then a few drops of HCl, and finally, add ammonia till the blue coloration appears.

This test shows the reaction with a solution composed of $\frac{1}{4}$ grm. NaNO_2 , in one litre H_2O , or 1 pt. $\text{Na.N}^2\text{O}$ in 6,400 pts. of water. This dyestuff may be kept in solution a long time without deterioration. (*Ber d. ch. Ges.*, 256. 1884.) J. H. S., JR.

On Dyestuffs, resulting from the Simultaneous Oxidation of Paradiamines with Monamines. R. NIETZKI.

In a previous communication it was shown that the dyestuffs produced by the simultaneous oxidation of paradiamines with monamines are converted by reducing agents into bases which are amido-derivatives of diphenylamine. Thus Bindschedler's dimethylphenylen green splits up, on reduction, into tetramethyldiamido diphenylamine. Shortly after this Majirt applied for a patent in which he described a process for producing methylen blue by the oxidation of a sulphuretted hydrogen solution of tetramethyldiamidodiphenylamine. The author had likewise observed this reaction, but comes to the conclusion that methylen blue had not been formed synthetically from tetramethyldiamidodiphenylamine. On treating a sulphuretted hydrogen solution of the above base with Fe_2Cl_6 the solution turns green, but not blue. Thus dimethylphenylen green is formed, notwithstanding the large excess of ferric chloride. Only after long standing and repeated addition of H_2S and Fe_2Cl_6 , did he succeed in obtaining a pure blue solution, from which only 5% coloring matter was obtained. The formation of methylen blue may, however, be easily explained. Dimethylphenylen green is easily decomposed with acids, splitting up into chinones, dimethylamine and dimethylparaphenyldiamine, viz.:

$$\text{C}_{16}\text{H}_{12}\text{N}_3\text{Cl} + 2\text{H}_2\text{O} = \text{C}_8\text{H}_4\text{O}_2 + \text{NH}(\text{CH}_3)_2 + (\text{CH}_3)_2\text{N}-\text{C}_6\text{H}_4\text{NH}_2 + \text{HCl}.$$

It is therefore probable that the dimethylparaphenyldiamine, in the nascent state, on coming in contact with the sulphuretted hydrogen is converted into methylen blue. If the blue were

formed directly from the dimethylphenylen green a much larger yield should be obtained than is actually the case. (*Ber. d. ch. Ges.*, 217, 1884.)

J. H. S., JR.

On the Detection of Adulterations in Portland Cements.

R. FRESSENIUS and W. F. FRESSENIUS.

The analysis is treated under the following heads :

- (a) Specific gravity.
- (b) Loss of weight on ignition.
- (c) Behavior with water, including alkalinity of aqueous solutions.
- (d) Behavior with dilute acids.
- (e) Behavior with permanganate solution.
- (f) Behavior with CO₂.

(a) This is determined by Schumann's method, which depends upon the space occupied by a volume of cement of known weight. The cement is introduced into a graduated flask filled with turpentine. The change of level is noted. The number of c. c. replaced by the cement, divided by the weight of the latter, give the Sp. Gr. It was found that pure Portland cement has a density of not less than 3.1, whereas adulterated cements have much lower densities.

(b) Two grms. cement are heated in a platinum crucible over a Bunsen burner to constant weight; 20 minutes heating is sufficient.

(c) The behavior of cements with water is characteristic. Various samples treated in the same manner impart to water different amounts of alkaline matter.

1 gram. of finely pulverized substance is shaken up with 100 c. c. distilled water for 10 minutes, the mixture filtered, and 50 c. c. of the filtrate titrated with $\frac{1}{10}$ volume HCl. The results indicate a decided difference between Portland and hydraulic cements.

(d) 1 gram. substance, finely pulverized, is treated with 30 c. c. in HCl and 70 c. c. water, and shaken up for 10 minutes, then filtered, and 50 c. c. of the filtrate titrated back with NaHO. From the figures so obtained the number of c. c. HCl, neutralized

by 1 grm. of cement, are calculated. These figures are lower for slag powder than for Portland cement.

(e) 1 grm. finely pulverized cement is treated with 150 c. c. of a mixture of 1 pt. dilute H_2SO_4 (sp. gr. 1.12) and 2 pts. H_2O , and then permanganate* sol. is run in until the solution reddens. 1 grm. Portland cement decolorizes from 0.17—0.53 c. c. corresponding to 0.79—2.8 mg. $KMnO_4$. Various samples of slag powder required from 9.5—16 c. c. corresponding to 44.34—74.67 mg. $KMnO_4$.

(f) This test is made to determine whether the so-called free lime, which should not be found in Portland cements, exists in hydraulic cements.

3 grms., finely powdered, are placed in a weighed glass tube, and submitted to the action of dry carbonic acid, at the ordinary temperature, for two hours. The increase in weight gives the amount of CO_2 absorbed. 3 grms. cement should not absorb more than 1.8 mg. CO_2 . Cements yielding figures which do not fall within these limits may be regarded as adulterated. (*Fres. Zeit.*, 1884, 175.)

J. H. S., Jr.

Copper Oxychloride as a Paint. T. MAXWELL LYTE.

In a letter to the editor of the *Chemical News* the author suggests the use of copper oxychloride for painting the interior of water tanks, and points out that while the salts of copper and mercury are active poisons to plants and infusorial life, the salts of the latter are too violently poisonous to be used in this case. Insoluble salts of copper, like the oxychloride, on the contrary, while fatal to vegetable growths and microbia, would be less liable to contaminate water for domestic use than the lead paints commonly used. The copper salt should be isolated from the surface of the iron by a coating of magnesia or zinc paint upon which it could then be laid. (*Chem. News L.* 152.)

A. A. B.

* 24.20 c. c. permanganate represents 0.2 grms. Fe. dissolved as ferrous salt.