

Abstracts from American and Foreign Journals.

Journal fuer Praktische Chemie.

ABSTRACTOR, EDGAR EVERHART, Ph.D.

On the Ethylsulphates of the Poly-Acid Alcohols and the Carbohydrates, with some Remarks on the Constitution of the latter, P. CLAESSON (20, 11).—Chlorosulphuric acid, SO_3HCl , was allowed to act on the polyatomic alcohols, by adding the latter gradually to the acid, which was kept at a low temperature. The aqueous solution of the saturated ethylsulphates is decomposed at first rapidly, afterwards slowly, into sulphuric acid and ethylsulphates of a lower degree of saturation; on warming, however, they are decomposed into sulphuric acid and alcohol. The salts of the ethylsulphates are either amorphous and very soluble, or crystalline and soluble with difficulty, or insoluble.

Glycoldisulphuric acid is a thick liquid insoluble in ether. It is decomposed at 150° . The barium salt, $\text{C}_2\text{H}_4(\text{SO}_4)\text{Ba} + 2\text{H}_2\text{O}$, crystallizes in hair-like needles. The potash salt is anhydrous, and forms a silver-like crystalline mass. The other salts are amorphous.

Glycerintrisulphuric acid is a snow-like crystalline mass. It is very deliquescent, and on contact with water evolves much heat, with a partial decomposition into acids of a lower grade of saturation. All its salts are amorphous. When the acid, itself, is mixed with ice-cold water, and allowed to stand for a day, it is decomposed, yielding glycerinedisulphuric acid.

Erythritetrasulphuric acid is also a snow-white crystalline mass, of small prismatic crystals. By long warming on the water-bath with an excess of water, it is reconverted into erythrite. The potash salt, $(\text{KOSO}_2)_4\text{C}_4\text{H}_6 + 4\text{H}_2\text{O}$, crystallizes in six sided tables. It is very slightly soluble in cold water, but more easily in hot. The barium salt, obtained by the double decomposition of the potash salt, forms prismatic crystals that are insoluble in water and acids.

Mannitohexasulphuric acid could not be obtained in a pure condition. When the aqueous solution of the acid is neutralized with barium carbonate and, after filtration, mixed with absolute alcohol, the barium salt separates as an oil, which crystallizes spontaneously and then becomes perfectly insoluble in water and acids. Its composition is $\text{C}_6\text{H}_8(\text{SO}_4)_6\text{Ba}_3 + 5\text{H}_2\text{O}$. At 100° it becomes black, and is decomposed. The other salts are amorphous and easily soluble. The free acid and its salts rotate polarized light to the right. If the aqueous

solution is allowed to stand for forty-eight hours, it is decomposed into mannitetrasulphuric acid. A longer standing produces a further decomposition.

Dulcitol dissolves in SO_3HCl with the formation of dulcitol, which in turn yields dulcitolpentasulphuric acid. This acid could not be obtained pure, and its barium salt forms a hygroscopic amorphous powder

Grape sugar, dextrin, starch and cellulose, dissolve in chlorosulphuric acid, and form one and the same crystalline compound, dextrosemonochloridetrasulphuric acid, $\text{C}_6\text{H}_7\text{O}(\text{SO}_2\text{H})_4\text{Cl}$, which rotates the plane of polarization strongly to the right, is deliquescent, and is easily decomposed by water, yielding a salt free from chlorine. The aqueous solution of the acid, after standing a day, is changed into dextrotrisulphuric acid.

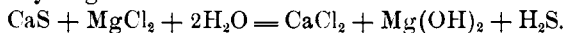
Inulin acts very energetically on chlorosulphuric acid, and seems to form a like levulosesulphuric acid, but owing to the ease with which it is decomposed, it could not be prepared.

Cane sugar is split up into dextrose and levulose by the action of SO_3HCl . Milk sugar yields a crystalline compound corresponding to dextrochloridetrasulphuric acid.

On the Presence of Bacteria, or their Germs, in the Organs of Healthy, Living Animals, M. NENCKI and P. GIACOSA (20, 34).—The authors describe a number of experiments in which they recognized such presence.

Results of the Norwegian North Sea Expedition, H. TORNØE (20, 44).—The author has estimated the amount of carbonic acid at different depths and in different degrees of latitude, without finding, however, any law governing the amount of acid. The neutral-combined carbonic acid varied from 51.4 to 55.4 mgrms per liter, and the acid-combined, from 39.7 to 47.9 mgrms per liter.

On the Recovery of Sulphur from Sulphurous Acid and Sulphuretted Hydrogen, J. STINGI and TH. MORAWSKI (20, 76).—The authors investigated the method of Schaffner and Helbig for the recovery of sulphur and carbonate of lime from soda residues. This method consists in treating the fresh soda residues with a corresponding amount of magnesium chloride, in hermetically closed iron retorts, at an elevated temperature, whereby magnesium hydrate and sulphuretted hydrogen are obtained:



The sulphuretted hydrogen then coming in contact with sulphurous acid and a solution of magnesium or calcium chloride, deposits sul-

phur in a flocky, quickly subsiding precipitate. The same solution of CaCl_2 or MgCl_2 may be used repeatedly. Stingl and Morawski have found, that according to the concentration at a higher or lower temperature, the magnesium chloride and calcium sulphide react on each other, producing a magnesium sulphide, probably Mg_4S_6 , which, in turn, at an elevated temperature in contact with water, is resolved into $\text{Mg}(\text{OH})_2$, with the formation of H_2S .

In the action of sulphuretted hydrogen on sulphurous acid, sulphur and pentathionic acid are formed, the yield of sulphur being largest when the H_2S is in excess, and the solution of sulphurous acid is very dilute. Pentathionic acid, the authors state, is decomposed by the carbonates of the alkalies and the alkaline earths, in the cold, to tetrathionic acid, but in the heat, to tetrathionic acid and sulphur. The sulphur precipitated in these reactions quickly settles in flakes when a salt is present.

Contribution to the Chemistry of the Chrom-Ammonia Compounds, S. M. JÖRGENSEN (20, 105).—The author begins with chloropurpleochromium chloride, which is best prepared by allowing the chromium chloride to oxidize in an ammoniacal solution of ammonium chloride, and by precipitating the same by boiling with hydrochloric acid. At the same time, minute traces of luteochromium chloride are formed. The chloropurpleochromium chloride, $(\text{Cl}_2[\text{Cr}_2\text{10NH}_3])\text{Cl}_4$, precipitated by hydrochloric acid, forms red, anhydrous, microscopic, octahedral crystals, that are soluble with difficulty in cold water. The neutral aqueous solution is very unstable, light quickly decomposing it with the separation of hydrated oxide of chromium. Boiling the aqueous solution changes it partly into the roseochromium chloride. The ammoniacal solution, on boiling slowly, deposits hydrated oxide of chromium; the presence of ammonium chloride, however, prevents the decomposition. The alkaline solutions of the salt are violet colored. In acids the chloropurpleochromium chloride is insoluble; in fact, the acids precipitate it from its salts. Nitrate of silver precipitates only 4Cl, the other two atoms are only precipitated on boiling. In this respect it behaves exactly like the corresponding cobalt compound.

The author goes on to describe the action of various substances, such as KCN, K_2CrO_4 , $\text{Na}_2\text{S}_2\text{O}_3$, $\text{K}_2\text{Cr}_2\text{O}_7$, H_2S , &c., on the chromium salt.

The platinum double salt, $\text{Cl}_2[\text{Cr}_2\text{10NH}_3](\text{PtCl}_6)_2$, is a brown, crystalline precipitate. The other salts, which correspond to the general formula $(\text{Cl}_2[\text{Cr}_2\text{10NH}_3])\text{R}_4$, are obtained by adding the

aqueous solution of chloropurpureochromium chloride (prepared in the cold) to the necessary acid. The bromide, $(\text{Cl}_2[\text{Cr}_210\text{NH}_3])\text{Br}_4$, forms carmine red needles; the mercury double salt, $\text{Cl}_2[\text{Cr}_210\text{NH}_3](\text{Hg}_2\text{Cl}_2)_2$, long insoluble needles, that decompose in the light, &c.

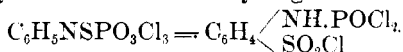
On the Constitution of Desoxalic Acid, JOSEPH KLEIN (20, 146).—In 1861, Loewig, by the reduction of oxalic acid ether with sodium amalgam, obtained a crystalline substance, having the formula $\text{C}_{11}\text{H}_{18}\text{O}_8$, which he regards as triethyl ether of the tribasic desoxalic acid, $\text{C}_8\text{H}_5\text{O}_8$. Brunner, however, regards the same substance as possessing the formula, $\text{C}_{12}\text{H}_{20}\text{O}_8 = \text{C}_8\text{H}_5(\text{C}_2\text{H}_5)_3\text{O}_8$. The author, on investigation, confirms the results of Loewig in every respect. He has prepared the monacetyl, the diacetyl, the monobenzoyl and the dibenzoyl compounds, in the form of thick, syrupy uncrystalline bodies.

Preparation of Nitro Acids of the Fatty Series, LEWKOWITZSCH (20, 159).—The author has prepared the corresponding nitro compounds by treating iodo-acetic ether, β -propionic ether and β -propionic acid, with argentic nitrite. The nitropropionic ether obtained is a colorless, mobile liquid, of an ethereal odor, that boils at $161\text{--}165^\circ$. β -nitropropionic acid forms crystals possessing a mother of pearl lustre, that melt at $66\text{--}67^\circ$. Tin and hydrochloric acid reduce it to β -alanine.

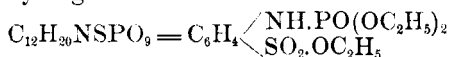
The Teachings of Chemical Valence and their Relation to the Electro-Chemical Theory, ALBRECHT RAU (20, 209).—The article does not admit of abstraction.

Contribution to the Knowledge of Sulphoaniline Acid, C. LAAR (20, 242).—The author finds that the acid crystallizes in two well defined modifications, the one in rhombic plates with one molecule of H_2O , the other in monosymmetrical plates with two molecules of H_2O . He makes his research, however, more especially on the salts of the acid, and has prepared a number of the same. The soda salt, $\text{Na}_2\text{C}_6\text{H}_4\text{NH}_2\text{SO}_3 \cdot 2\text{H}_2\text{O}$, crystallizes in leaves; the potash salt, with $1\frac{1}{2}\text{H}_2\text{O}$, in rhombic prisms; the baryta salt, with $3\frac{1}{2}\text{H}_2\text{O}$, in rhombic prisms; the copper salt, with $4\text{H}_2\text{O}$, in blackish-green prisms, that lose their water of crystallization at 100° , and become reddish-brown in color. The aniline salt crystallizes in needles, and on heating to 150° in its dry condition, loses its aniline, and the acid remains behind. The author, however, has more particularly studied the action of phosphorus pentachloride on the potash salt of the sulphoaniline acid. On adding phosphorus pentachloride to potassium sulphoaniline beneath dry benzole, after the evaporation of the ben-

zole, small, spindle-shaped crystals are obtained, that melt at 158°. The body is very unstable. The analysis gives the formula :



In order to prepare the ether corresponding to this chloride, the author heats on the water bath a dry mixture of potassium sulphaniline with phosphorus pentachloride. The raw product was then poured into absolute alcohol, filtered and mixed with water; by repeating this treatment, long crystalline leaves were obtained, that melted at 102°. The analysis gave the formula :



By pouring the raw product obtained by heating potassium sulphaniline with phosphorus pentachloride, into absolute methyl alcohol, the corresponding methyl ether is obtained. The latter melts at 114°. On boiling the ethyl compound with water, it is decomposed into sulphaniline, alcohol and ethyl-phosphoric acid. The last is further decomposed into phosphoric acid and alcohol.

The potash salt of the dibromsulphaniline, acted on by phosphorus pentachloride, is decomposed by alcohol in the same way, except that only two atoms of chlorine are replaced by the oxy-ethyl. The ether, $C_6H_2Br_2 \left\langle \begin{array}{l} NH.PO(OC_2H_5)_2 \\ SO_2Cl \end{array} \right.$, is mostly decomposed by the simple precipitation with water. The dibromphosphoanilinesulphochloride melts at 170°, and is easily soluble in acetone, chloroform and benzole.

By the action of phosphorus pentachloride on dimethylsulphaniline, is obtained the sulpho chloride, out of which is prepared the ethyl ether, $C_6H_4 \left\langle \begin{array}{l} N(CH_3)_2 \\ SO_2.OC_2H_5 \end{array} \right.$. The ether is crystalline, and melts at 85°. Dimethylsulphaniline is decomposed at 230°. Its barium salt is obtained in two modifications.

By oxidizing potassium sulphaniline with potassium permanganate, potassium salt of azophenyldisulphonic acid was obtained. The salt crystallizes in beautiful, red crystals. They are with difficulty soluble in water, and give with $BaCl_2$ and $AgNO_3$, orange colored crystalline precipitates, which are decolorized on warming with stannous chloride.

On Oxyphenylacetic Acid and its Derivatives, PAUL FRITZSCHE (20, 267).—The oxyphenylacetic acid, $CH_2(OC_6H_5)CO_2H$, was prepared by action of sodium phenol on sodium monochloracetate. The free acid crystallizes in long, white needles, having a peculiar

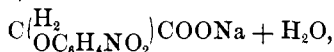
odor and a bitter, sour taste. It is slightly soluble in cold water, easily in hot. The melting point is 96° . A little moisture lowers the melting point perceptibly. It distills without much decomposition at 285° . The distillate remains for a long time liquid and then suddenly solidifies. Ferric chloride produces a yellow precipitate in solutions of the acid. The acid is not poisonous and possesses strong antiseptic qualities. Its salts, especially those of the alkalies, are easily soluble in water; some melt in boiling water, some only above 100° , or not at all.

The methoxyphenylacetic ether is a thick, oily liquid, of 1.15 sp. gr. It boils at 245° . Its odor is peculiar, but not disagreeable. The ethyl ether has a specific gravity of 1.104, and boils at 251° . When ethyloxyphenylacetic ether is allowed to remain in contact with a strong aqueous solution of ammonia, long needles of oxyphenylacetamide are formed. They are but very slightly soluble in water, and melt at 101.5° . With hydrochloric acid it yields a beautiful crystalline salt. By distilling the amide with phosphoric anhydride, oxyphenylacetonitrile is produced. This last is a clear, oily liquid, boiling at $235\text{--}238^{\circ}$, and possessing a specific gravity of 1.09.

When oxyphenylacetonitrile, $C(\overset{H_2}{OC_6H_5})CN$, is warmed with alcoholic ammonia in a stream of sulphuretted hydrogen, oxyphenylacetothioamide, $C(\overset{H_2}{OC_6H_5})CSNH_2$, is produced in the retort. It crystallizes in rhombic prisms that melt at 111° . By boiling with alkalies, it is decomposed into ammonia, oxyphenylacetate and sulphide of the alkali metal.

Finally, when aniline and oxyphenylacetic acid are heated together to 150° , a crystalline mass is obtained, that consists of oxyphenylacetanilide, $C(\overset{H_2}{OC_6H_5})CON(\overset{H}{C_6H_5})$. It crystallizes in needles that melt at 99° .

Orthonitroxyphenylacetic acid was prepared analogously to the oxyphenylacetic acid, by heating orthonitrophenol sodium with sodium monochloracetate. The pure acid crystallizes in small octahedra, that melt undecomposed at 156.5° . It dissolves easily in alcohol, slightly in water. Its color is pale yellow. The salts of orthonitroxyphenylacetic acid are similar to those of oxyphenylacetic acid. The soda salt,



crystallizes, as do the baryta, copper and other salts.

On reducing this nitro acid with stannous chloride, the anhydride of the amido acid, $C_8H_7NO_2$, is obtained. The anhydride is slightly soluble in water and cold alcohol, but easily in hot alcohol. It crystallizes in small needles, melting at $143-144^\circ$, but subliming at a lower temperature. It is soluble in soda or potash, without, however, forming salts. Even boiling potash fails to change it into the amido acid.

The paranitroxyphenylacetic acid, $C_8H_7NO_5$, is prepared exactly in the same way as the ortho compound. It crystallizes in rhombic or monoclinic leaves, and melts at 183° . It is slightly soluble in water, but easily in alcohol. Its taste is bitter and sour. Its aqueous solutions are colored strongly yellow on the addition of alkalis. Its soda and baryta salts are yellow. The copper salt is cerulean blue, but at 150° loses its water of crystallization, and becomes green.

Although it appears that the paranitroxyphenylacetic acid yields, on reduction, a true amido acid, still no satisfactory results could be obtained.

Monobromoxyphenylacetic acid was prepared by the author, by adding bromine to a solution of oxyphenylacetic ether in carbondisulphide, and by saponifying the ether, so obtained, with soda. The monobromoxyphenylacetic acid, $C_8H_7BrO_3$, crystallizes in quadratic prisms, which melt at $153-154^\circ$. It is slightly soluble in water, but easily in alcohol. It does not possess so great a tendency to form ethers as the oxyphenylacetic acid. Its soda salt contains $2H_2O$, its baryta salt, $3H_2O$.

Bromoxyphenylacetic ether is made in the preparation of the foregoing. It is insoluble in water, soluble in hot alcohol, and crystallizes in rhombic plates that melt at 59° .

On the Action of the Molten Alkalies on some Aromatic Sulpho Acids, PAUL DEGENER (20, 300).—The author continues a former research (Journ. f. prakt. Chem., 17, 390) on the same subject. The sulpho acid salts were melted, both with potash and soda, as well as with a mixture of the two.

First, in the action of the alkalies on phenolorthosulphonic acid, it was found that the yield of brencatechin was best when potash alone was used. The yield also depends upon the temperature as well as the quantity of the potash used. Below 290° no brencatechin was obtained, while by heating 24 mols. KHO with 1 mol. $C_6H_4OHSO_3K + 2H_2O$, to 360° , about twenty per cent. of the theoretical amount was obtained. When the heat was continued too long or was too high, the yield was again lower. By heating potash with phenolpara-

sulphonic acid to 360°, nothing was obtained, but at a higher temperature, some phenol and diphenol, but no hydroquinone or resorcine. From benzoedisulphonic acid (1 : 3) potash produces, at a temperature of 270°, resorcine. Soda yields, in all cases, smaller results.

Reports on American and Foreign Patents Relating to Chemistry.

American Patents.

Condensed from the Official Gazette of the U. S. Patent Office, by ARNO BEHR.

June 1, 1880.

228,181.—*Treatment of petroleum lubricating oil and lard oil.* HENRY V. P. DRAPER.

An addition of chloroform to the oil, will keep the oil liquid at a comparatively low temperature.

228,221.—*Paper for bank notes, checks, etc.* JAMES SANGSTER.

Ruling lines across the surface of an ordinary paper with alkali, and then removing or neutralizing the alkali.

228,300.—*Manufacture of artificial indigo-blue.* ADOLF BAEYER.

If a solution of a mixture of orthonitrophenylpropionic acid, an alkali and glucose, is printed on yarn or cloth, indigo-blue is developed in and upon the fibre by simple application of heat.

228,328.—*Process of making artificial parchment out of toughened paper.* LOUIS H. G. EHRHARDT.

With the paper pulp is mixed silicate of soda, alum and chloride of zinc.

228,362.—*Dry-copying process.* VINCENZ KWAYSSER and RUDOLF HUSAK.

The inventors claim the method of producing on an absorbent surface, possessing the properties of remaining moist and elastic, a transfer impression, reverse from the original writing, and then printing copies from it by pressing dry sheets of paper thereupon.

228,387.—*Process and apparatus for the manufacture of fertilizers.* WM. PLUMER.

Refers to the drying of night soil, and to its transformation into a fertilizer.

228,389.—*Solution for electro-deposition of nickel.* JAMES POWELL.

Claims a mixture of a nickel salt, pyrophosphate of soda or potash, or a mixture of pyrophosphate of soda, phosphate of nickel, bisulphite of soda and citrate of nickel and ammonia.