ABSTRACTS

GENERAL AND INORGANIC CHEMISTRY.

Composition of the Alkaline Permanganates. F. M. Raoult.

The formula of permanganates, K MnO_4, contains an odd number of atomicities. To obviate this anomaly it was proposed to double the formula or to admit in it an atom of hydrogen. The author claims that he has already shown that the molecule of potassium permanganate only contains 1 atom of potassium. Having introduced into a retort 104.56 grms. of pure and dry permanganate in communication with a calcium chloride tube, and having brought the retort to 400° he only collected 0.012 gr. of water. If the permang. had contained 1 atom of hydrogen the weight of water ought to be 5.948 grms. Consequently the permanganate does not contain H. Sodium permanganate yielded H_2O in precisely the quantity answering to $NaMnO_4+3H_2O$, as 43.95 gr. of salt yielded 12.057 gr. water. Consequently the real formula of permanganic acid is $HMnO_4$. (*Bul. Soc. Chim.*, **46,** *805.*) M. L.

On the Water of Combination of Alums. E. Maumené.

The author confirms the fact already established by him that alums contain in weight an amount of water equal to their percentage in anhydrous alum, that is 28.73 equivalents of water. Alumino-potassic alum left for several months in presence of H_2SO_4, lost an amount of water, regarding stationary states of dehydration, which in no way corresponded to the so-called hydrate with 24 H_2O. (*Bul. Soc. Chim.*, **46,** *807.*) M. L.

ORGANIC CHEMISTRY.

Alcoholate of Potassium Hydroxide. R. ENGEL.

KOH, suspended in alcohol until the latter is saturated, causes the formation of two layers, one of aqueous and the other of alcoholic potash. On keeping the latter at 0° for 24 hours, unctuous white crystalline plates are deposited of the composition $KHO + 2(C_2H_5)OH$, which alter rapidly under the influence of air. This decomposition does not take place in cold of 0° in closed vessels, but at 30° it begins. At 60° the crystals melt and two layers are slowly formed. At 100°–120 the decomposition is very rapid according to the equation $KOH(C_2H_5)_2OH = C_2H_5OK + C_2H_5OH + H_2O$, the liberated water being saturated with the potash. The upper alcoholic layer, when cooled, deposits slender needles of the probable composition $C_2H_5OK + C_2H_5OH$. The formation of potassium ethoxide by the action of heat on alcoholic potash explains the action of the latter on many organic compounds. (*Compt. Rend.*, **103**, *155.*) R. W. M.

Alcoholate of Potassium Hydroxide. E. J. MAUMENÉ.

The author obtained, in 1872, a crystalline alcoholate of potassium hydroxide of the composition $KOH + 2.44 (C_2H_5) OH$. The compound gradually became covered with a crystallized, colorless salt $C_2H_7O_2K$, which gives characteristic reactions with several metallic salts. (*Compt. Rend.*, **103**, *215.*) R. W. M.

Action of Ammonia Salts on Glycerin. L. STORCH.

1. Action of ammonium sulphate. The glycerin was heated with 35–40 per cent. of the salt and about 7 per cent. of English sulphuric acid and distilled. The distillate is yellowish, smelling slightly of ammonia, and gave a reaction for pyridine bases. Hydrated pyridine bases were not present. In other fractions of the distillate picoline, β picolin and lutidine occurred. Indications of the presence of oxy-bases of the pyridine series were also obtained. Ammonium phosphate acts in a similar manner to the sulphate but gives better results. Aqueous and alcoholic ammonia have no effect on glycerin. Ammonium oxalate, heated with glycerin,

gives a stream of cyanogen gas while ammonium cyanide, carbonate and formiate are formed. Ammonium chloride in its action on glycerin has been studied by Etard. (*Comptes Rendus*, **102**, *460,795*, through *Berichte*, **19**, *2459.*) R. W. M.

Nitro-Compounds of the Fatty Series. P. Alexeeff.

The various formulæ for the so-called nitroethane proposed by Meyer are discussed by the author who considers it to be isonitroso-ethyl alcohol, $OH\cdot CCH_3:N\cdot OH$, this view best explaining its decomposition by hydrochloric acid into acetic acid and hydroxylamine and many other characteristic reactions. (*Bull. Soc. Chim.*, **46**, *266.*) R. W. M.

Composition of Barley Fat. A. Stellway.

The ether extract when dried gave a yellow oil which on cooling deposits a firm crystalline fat. The fat melts at 13°, and requires for saponification 182.7 m. g. KOH per gramme. The composition was:

Free Fatty Acids	13.62 %
Neutral Fats	177.78 %
Lecethin	4.24
Cholesterin	6.00

(*Bied. Centr.*, **15**, *573.*) R. W. M.

Electrolysis of Normal Caproic Acid with Alternate Currents. E. Drechsel.

200 grammes magnesium caproate in three liters of water, electrolysed for 80 hours with a Siemens-Halske alternate current machine gave off hydrogen and carbon dioxide but no oxygen, hydrocarbons or oil. The product was treated with sulphuric acid, the unchanged caproic acid removed and distilled. In the distillate were found valeric and butyric acids while oxalic, adipic, hydroxycaproic and glutamic acids were found in the residue, also other acids in very small quantities. The author suggests that the combustion of foods and tissues in the organism may take place and follow the same laws as in the above experiments. (*J. prakt. Chem.*, *XXVII.*, **34**, *135.*) R. W. M.

Propionic Acid. A. RENARD.

This acid is yielded in considerable quantity by the destructive distillation of colophony. When purified and dried it boils at 141.5°–142° under 755 m.m. pressure, is liquid at 50° and is soluble in all proportions in water, ethyl alcohol, ether, benzene and light petroleum. Specific gravity 1.0089 at 0° and .9904 at 18°.

The aqueous solution boils at 98.6–99.5°, the distillate varying in acidity with the amount of acid in the solution. Calcium chloride causes the separation of the acid from the water solution, but sodium chloride and sulphate do not. The sodium salts will, however, effect this separation in the presence of small quantities of butyric or valeric acid, benzene or light pretroleum; acetic acid tends to prevent this separation. (*Compt. Rend.*, **103**, *157.*)

R. W. M.

A Fatty Bait for Wire Drawing.

A known amount of lard is melted and cooled to 50°–60°, then, with continual stirring, 20–40 per cent. of 60–66° sulphuric is added until the mass has the consistency of a soft soap, when water is added, with continued stirring, until the whole mass is dissolved in the water. Care must be taken on the addition of the sulphuric acid that the temperature does not rise too high. The use of this compound facilitates the drawing to such an extent that during the drawing less heating of the wire is necessary, also the wire has a finer lustre and does not rust easily. (*Dingler's polyt. Journ.*, **262**, *285.*) R. W. M.

Lactates. H. MEYER.

Barium lactate with 2 or 1 molecule of water crystallized in rectangular needles, soluble in water and glycerin, insoluble in alcohol. The last molecule of water of crystallization is removed without decomposition. Aluminium lactate crystallizes in anhydrous triclinic octahedra; sodium aluminium lactate in rectangular prisms or tables. (*Ber. d. chem. Ges.*, **19**, *2454.*) R. W. M.

Butter and its Substitutes. E. Scheffer.

The author uses as a solvent a mixture of 40 parts of rectified amylic alcohol and 60 parts of ether by volume. The substance and solvent are placed in a corked test tube at about 65° F. and warmed to about 82° F. One gramme of the following fats and mixtures of fat required for solution the following amounts of the solvent:

Butter	3	c.c.,	Lard	5	parts,	Butter	95	parts,	3.5	c.c.
Beef Suet	50	"	"	1	"	"	9	"	3.9	"
Leaf Lard	16.4	"	"	2	"	"	8	"	4.8	"
Neutral Lard	13.5	"	"	3	"	"	7	"	5.7	"
Cottonseed Oil	1.75	"	"	4	"	"	6	"	6.5	"
Stearin	550.0	"	"	5	"	"	5	"	7.8	"
Oleomargarine	11.2	"	"	6	"	"	4	"	9.6	"
Oleomargarine	8.6	"	"	7	"	"	3	"	11.4	"
Oleo Oil	2.3	"	"	8	"	"	2	"	13.0	"
Butterin I	11.0	"	"	9	"	"	1	"	14.4	"
Butterin II	8.0	"								

The advantages claimed are simplicity of manipulation and the characteristic differences shown by the various fats. (*Amer. Jour. Pharm., 1886.*) R. W. M.

On Chloroso-phosphorous Ethers. L. Lindet.

The author has observed that the protochloride of gold and phosphorous $Au_2Cl\ P\ Cl_3$ forms compounds with the alcohols of the fatty series. Dry crystals of this double chloride dissolved in absolute and pure methylic alcohol give an elevation of temperature, and by cooling, the liquid gives long, colorless needles of a silky texture, melting at 100–101°. Ethylic alcohol, pure and absolute, similarly treated, gives by addition of water an oily liquid, insoluble in water, crystallizing at 16° as a white mass. This body, although containing 50% of gold, has a sp. gr. of 2.025. These bodies answer to the formula $Au_2ClP(C_2H_3)_3O_6$ or in atomic notation $Au\ Cl\ P(OC\ H_3)_3$, the other being $Au\ Cl\ P(OC_2H_5)_3$. (*Bul. Soc. Chim.*, **46**, *809.*) M. L.

ANALYTICAL CHEMISTRY.

Successive Separation of Copper, Cadmium and Zinc from Nickel and Cobalt (Iron and Manganese). M. Carnot.

The process of separation is based on the action of hyposulphites and of H_2S in solutions containing acids of decreasing energy: sulphuric or hydrochloric, oxalic and acetic.

Copper and Cadmium.—The liquid, acidulated with 10 or 15 c.c. of hydrochloric acid and diluted to 200 or 300 c.c., is boiled; the solution of hyposulphite is added in small quantities until the copper sulphide is all thrown down. The cadmium remains in solution and can be precipitated by H_2S or NH_4HS.

Cadmium and Zinc.—The separation is produced as above but in presence of oxalic acid. The cadmium alone is thrown down; a preliminary separation can be made by the precipitation of the zinc as oxalate, very sparingly soluble in NH_4Cl and in ammonium oxalate. The solution of oxalate contains all the cadmium and all or a portion of the zinc; the cadmium is thrown down by the hyposulphite. The solution containing the zinc is precipitated by H_2S.

Zinc and Nickel (or Cobalt).—It is sufficient to add sodium or ammonium acetate to the liquids treated as above, and to pass H_2S. In presence of iron or manganese it is necessary to use potassium oxalate instead of the ammonium salt.

Zinc and Iron.—The chlorhydric solution nearly neutralized with NH_3 is treated with H_2S, and potassium oxalate to finish precipitation of the zinc. The iron remains in solution.

Zinc and Manganese.—The separation is conducted as for zinc and iron.

Zinc, Nickel, Manganese.—The three sulphides are thrown down successively in an oxalic acid, an acetic acid and a neutral or ammoniacal solution respectively.

Nickel, Iron, Manganese.—The iron is precipitated by H_2S in an acetic acid solution containing a very small amount of free acid. The manganese remains in solution. (*Bul. Soc. Chim.*, **46**, *812*.)

M. L.

Method of Rapid Separation of Gold and Platinum from Antimony, Arsenic and Tin. Ph. J. Dirnell.

The author combines the methods of Silva and of Carnat. Silva's method is based upon the reduction by chloral hydrate of the soda solutions of the sulphides of gold and platinum dissolved in aqua regia, as it is worked in a regular qualitative analysis.

The sulphides precipitated from $(NH_4)_2S$ by H Cl, are dissolved in aqua regia; a concentrated solution of sodium oxalate is added, then an excess of oxalic acid, varying with the amount of antimony and a large excess of pure caustic soda (by alcohol). The liquid is heated to 100°; a solution of chloral hydrate is added, drop by drop; Au and Pt are precipitated. The filtered solution is then treated by Carnat's method. (*Bul. Soc. Chim.*, **46**, *806*.)

M. L.

Apparatus for Determining Melting Points. C. F. Roth.

A flask, 65 m.m. in diameter, with a neck 200 m.m. long and 28 m.m. wide, has a tube 15 m.m. wide, closed at the lower end, fused into its mouth. The tube reaches to within 17 m.m. of the bottom of the flask. The neck of the flask is provided at its upper end with an opening which can be closed with a tap. Sulphuric acid is poured into this until it reaches about half way up the neck of the flask. When heated the temperature is nearly the same in all parts of the apparatus. Good results are obtained by it. (*Ber. d. chem. Ges.*, **19**. *1970*.)

R. W. M.

Detection of Salicylic Acid in Foods. S. H. Jaffe.

The author, to obviate the difficulties caused by solution, in the sulphuric ether used to separate the salicylic acid from the different tannins and other extractive matters in the foods and drinks to be tested, proposes to use a mixture in equal volumes of sulphuric ether and petroleum ether (D=0.650). This petroleum ether is obtained by fractional distillation of American petroleum, and the distillate is purified by sulphuric acid.

Beers gives an emulsion with ether or even with the mixture indicated. The author adds then a w quantity of ether mixture to the emulsion, and mixes with a glass rod. (*Bul. Soc. Chim.*, **46**, *808.*) M. L.

Presence of Matter Soluble in Ether in Filter Paper.
P. VEITH.

A substance having an aromatic vanilla like odor is obtained by extracting filter paper with ether. It is present in sufficient quantities to affect the Adams method .003—.006 per cent. (*Landw. Versuchrs., 1886, 203.*) R. W. M.

Drying Fats. A. SONNENSCHEIN.

Fats can be conveniently dried by aspirating dry air through them while heated on the water bath. (*Zeit. anal. Chem.*, **25**, *272.*) R. W. M.

Estimation of Nitrogen in the Milk and Urine of Herbivora. H. WEISKE.

The Kjeldahl process can be used with the additional process of oxidation by permanganate if desired. Higher, and therefore more correct, results are obtained by the Kjeldahl than by the Will-Varrentrapp process. (*Landw. Versuchsst, 1886, 305.*) R. W. M.

Abstracts of American Patents Relating to Chemistry.

(*From the Official Bulletin of the U. S. Patent Office.*)

December 7th, 1886.

353,695.—Cement for use in manufacturing stained glass. R. McKee.

Consists of amber, copal, alcohol, powdered glass, ether, and silver powder.

353,697.—Making artificial bone, ebony, marble, etc. L. R. Mestaniz.

Consists of skim milk, salt, caustic soda, terra alba, hydrochloric, nitric, and sulphuric acids, and coloring matter.

353,825.—Manufacture of phosphates from slags. C. Scheibler.

The slags obtained in the basic process of dephosphorization of iron are roasted in an oxidizing flame, reduced to powder, and treated with hydrochloric acid of certain strength. The solution containing silica, alkaline earth, phosphates, and oxides of iron and manganese is fractionally precipitated, whereby the phosphates of iron and manganese, and then the phosphates of the alkaline earths are separately obtained. The phosphates of iron and manganese are oxidized, dissolved, precipitated, and a further quantity of the phosphates of the alkaline earths obtained.

353,896.—Composition for use in the manufacture of artificial marble. C. Straub.

Consists of glue, boiled linseed oil, water, acid, and plaster of paris.

353,998.—Process of and apparatus for distilling wood. T. W. Wheeler.

354,067.—Apparatus for mixing air and gas and delivering the mixture to carburetors. R. S. Lawrence.

December 14th, 1886.

354,109.—Removing fiber from cotton seed. W. L. Dudley.

The fibrous covering of cotton and other seeds is coverted into readily inflammable material, by treatment with chemical solutions, and consumed by the quick application of heat.

354,126.—Composition of matter for the manufacture of axle bearings. G. F. Goadley.

Consists of graphite, asbestus, and aluminium sulphate.

354,182.—Process of treating and desilverizing copper matte. J. J. Crooke and R. Crooke.

354,185.—Apparatus for manufacturing illuminating and heating gas. F. B. Foster.

354,330.—Condenser for pyroligneous acid. J. A. Mathieu.

354,343.—Process of gilding glass. J. Pratt.
The glass is treated with a solution of stannous chloride, and then a gilding solution is poured over it.

354,345.—Composition for neutralizing fumes of explosives. T. Price.
Consists of ammonium carbonate, ammonium urate, lime and ferrous sulphate.

354,393.—Process of obtaining sulphur from sulphuretted hydrogen. C. F. Claus.
A mixture of hydrogen sulphide and air is passed through a chamber containing ferric oxide mixed with lime, magnesia, alumina, or other like sub stance

354,477.—Process of bleaching vegetable fibre for the manufacture of paper. J. A. Just, F. A. Fletcher, and C. A. Gibbs.
The fibre is treated with a bath of zinc sulphate, and then subjected to the action of a bleaching agent.

December 21st, 1887.

354,574.—Carburetor. W. H. O'Connor.

354,611.—Waterproof composition for roofing, etc. B. Overlack.
Consists of white sharp sand, rosin, slacked lime, boiled linseed oil, sulphuric acid and copper suboxide.

354,650.—Method of purifying water. W. J. Morrison and J. C. Wharton.
First a mixture lime, soda and sand is added to the water, and then a mixture of alum, potassium permanganate and sand.

354,714.—Process of dyeing wool azodiphenyl blue. C. Lohmann.
Wool is boiled in an aqueous solution of azodiphenyl blue, extract of logwood, copper sulphate, ferrous sulphate, an alkali bisulphate, and oxalic acid.

354,734.—Ice machine. T. L. Rankin.

354,746.—Production of coloring matter. L. Schad.
A bluish black coloring matter produced by the action of diazoazobenzenedisulpho acid on paratolylbetanaphthylamine.

354,755.—Manufacture of oxidized or solidified oil. F. Walton.

354,834.—Artificial stone or marble. T. Hurtz.
Consists of hydraulic cement and sand or gravel, moistened and combined with a solution in water of sodium silicate, calcium chloride, barium hydroxide, lime water, glycerol, and potassium carbonate.

354,853.—Apparatus for purifying and ageing liquors and purifying water and oil. S. G. Cabell.

354,855.—Purifying water for steam boilers. W. Friede.
Consists of water, catechu, sodium hydroxide, sodium hyposulphite, glycerol, and tanners' bark.

December 28th, 1886.

354,923.—Process of extracting nickel and cobalt from ores. D. Mindeleff.
The lump ore is heated with hydrocarbon gas in a closed chamber, then pulverized and mixed with water to a pulp. From the pulpy mass, the metallic particles are separated by means of an electro magnet.

354,965.—Recording thermometer. C. A. Black and P. C. Pfister.

355,019.—Paint composition. G. Jordan.
Consists of spirits of turpentine, gutta percha, Venetian turpentine, and dry ground pigment.

355,222.—Apparatus for desulphurizing ores. F. Sibley.

355,289.—Vacuum evaporating and distilling apparatus. H. T. Yaryan.

W. R.