ABSTRACTS.

ANALYTICAL CHEMISTRY.

Analysis of the Barium Group. By Dr. C. Lüdeking.

The author finds that in the customary test with calcium sulphate solution for barium and strontium, considerable quantities of these may be overlooked. The limits of precipitation may be seen in the following table:

Quant. of Chloride.	Dissolved in Water c. c.	Reagent.	Remarks.
1. 0.003g Ba	2 c. c.	1 c. c. Ca SO_4 sol.	Definite precipitation.
2. 0.002g Ba	2 c. c.	" "	Precip. only after standing some time.
3. 0.001g Ba	3 c. c.	1 gtt. K_2CrO_4 sol.	Precipitate.
4. 0.020g Ba 0.986g Ca	4 c. c.	1 c. c. Ca SO_4 sol.	No precipitate.
5. 0.003g Ba 0.986g Ca	2 c. c.	3 c. c. Sod. Acetate sol. 2 c. c. $K_2Cr_2O_7$ sol.	No precipitate in cold, but after boiling.
6. 0.010g Ba 0.986g Ca	13 c. c.	1 c. c. Ca So_4 sol.	No precip. Precip. on addition of K_2CrO_4
7. 0.001g Sr	2 c. c.	1 c. c. Ca SO_4 sol.	No immediate precip. on boiling. Precip. after 15 minutes.
8. 002g Sr	2 c. c.	1 c. c. Ca SO_4 sol.	Immediate precip. on boiling.

Calcium chloride was found to interfere very much with the precipitation of strontium by Ca SO_4 solution.

A solution containing 30% of $SrCl_2.6H_2O$ is precipitated by **Ca** SO_4 solution in the cold.

Under favorable conditions the author considers .1% $BaCl_2$ and .06% $SrCl_2$ the limits by the calcium sulphate test, while potassium chromate will give a distinct precipitate with a solution containing only .03% of $BaCl_2$. The reactions are much less delicate when considerable quantities of strontium or calcium chloride are present. It is therefore recommended that the precipitated carbonates of the barium group, after careful washing, be dissolved in acetic acid, and the solution tested with potassium bichromate solution,* heat if necessary. If a precipitate forms, filter. Examine the precipitate for barium. The filtrate is neutralized with NH_4OH, precipitated by ammonium carbonate, washed, dissolved in hydrochloric acid and tested for strontium by the spectroscope. Separate the strontium, if present, by means of sulphuric acid, and in the filtrate test as usual for calcium. *Ztschr. anal. Chem.*, *29, 556-561.* J. F. G.

Reactions of Resorcin and Thymol. By H. Bornträger.

Resorcin and thymol both give red color reactions with nascent nitrous acid, the former blood red, the latter yellowish red.

In alcoholic solution both remain clear, but in water solution the thymol deposits yellowish red flakes. The thymol also produces an ethereal odor due to formation of thymol nitrite.

Another distinctive test is to place in a test tube about equal quantities of some dry nitrite, calcium sulphate and sodium bisulphate, moisten with water, add the liquid to be tested and heat the mixture. In presence of thymol the mixture becomes chrome red, while resorcin gives rise to a dark chrome green color and bright red drops in the upper part of the tube. The solution must be acid to develop the colors. (*Ztschr. anal. Chem.*, **29**, *572.*) J. F. G.

Estimation of Zinc in its Ores. By Delfo Coda.

In the customary method for estimating zinc in its ores considerable zinc is lost by being enclosed in the precipitated iron

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* This method of separation is not new, as it has been used by the students from the laboratory of the Univ. of Michigan, for over ten years. See also "Qualitative Chemical Analysis," by Douglas & Prescott, 3d Ed., p. 242 J. F. G.

from which it is not totally removed by washing. To prevent this loss the author recommends ammonium sulphate.

Dissolve 2.5g zinc ore in 15 to 20 c.c. aqua regia, evaporate, add 15–20 c.c. H_2S0_4, heat until sulphuric acid vapors rise so as to ensure removal of Cl and NO. In presence of Cu, Cd., etc., dilute and precipitate by H_2S, filter and remove H_2S from filtrate by boiling. The filtrate containing Zn, Fe, Mn and alkalies; neutralize with ammonia, then add 40 c.c. ammonia (10% ?), containing one-quarter ammonium carbonate. The iron is precipitated free from zinc. Cool, dilute to 500 c.c., filter through a dry filter and of the filtrate take portions of 100 c.c., dilute each to 250 c.c. This solution is ready for titration with sodium sulphide solution.

For comparison or standardizing dissolve a known weight of zinc (the quantity should be about that contained in .5 grm. of the zinc ore under examination) in 4 c.c. hydrochloric acid, dilute, make alkaline with 20 c.c. ammonia, dilute again to 250 c.c. For precipitation use a 2% solution of crystalized sodium sulphide, using sodium nitroprusside as an indicator of the end reaction. The several portions of 100 c. c. each serve for checks upon each other in the titration. (*Ztschr. anal. Chem.*, **29**, *266–271.*) J. F. G.

Examination of Alcoholic Liquors. By W. Fresenius.

A lengthy and valuable paper on the examination and appraising of alcoholic liquors. The article does not admit of a brief abstract, hence the readers are referred to the original. (*Ztschr. anal. Chem.*, **29**, *283–317.*) J. F. G.

Valuation of Zinc Dust. By G. Klemp.

The author bases his method upon the reduction of iodic acid in alkaline solution. The comparative estimations with other methods gave very satisfactory results. Metallic iron and lead will always interfere more or less with oxidation and reduction methods.

Requirements:

A solution of 15.25 grms. KIO_3 in 300 c. c. of water, of which solution 3 c. c. are used for each 0.1 grm. zinc dust taken.

An alkaline solution containing either 300 grms. NaOH, or about 370 grms, KOH per litre, of which 10 c. c. are to be used for each 0.1 grm. zinc.

Of the finely divided and carefully mixed dust weigh out 0.5 to 1 grm. into a dry glass stoppered flask of about 200 c. c. capacity. Mix the required amounts of KOH and KIO_3 solutions (10 c. c. of the former, and 3 c. c. of the latter for each 0.1 grm. zinc taken) in a beaker, and after adding a few glass beads to the zinc in the flask, pour in the alkaline mixture, stopper securely, and agitate the contents of the flask for about five minutes. Cool before removing the stopper. * Remove the contents of the flask to one of 250 to 500 capacity, according to the quantity of zinc taken. Fill up to mark after cooling and contraction has taken place upon diluting the solution. Mix thoroughly and remove 100 c. c. to a suitable retort for distillation. It is essential that cork and rubber stoppers be avoided, hence, the ground stopper end of the retort must be carefully fitted to the receiver used. In the latter there are placed for 100 c. c. sol., when .5 grm. zinc was taken, 20 c. c. of a solution containing .4 grm. KI. Through a funnel dilute sulphuric acid is added to the contents in the retort and the latter immediately connected with a CO_2 apparatus. Heat is now gradually applied to the retort until the contents boil actively.

Distillation is usually completed in about 20 minutes. It is well to protect the receiver with a safety tube containing KI sol. so as to prevent loss of I. which may be carried over by the CO_2 current. A suitable apparatus is that of Topf (*Ztschr. anal. Chem.*, **26**, *293*). The liberated iodine is estimated volumetrically by means of sod. hyposulphite sol.

The reactions are based upon the equations :

$$15\ Zn + 30\ KOH = 15\ Zn\ (OK)_2 + 15H_2$$
$$5\ KIO_3 + 15H_2 = 5\ KI + 15\ H_2O$$
$$KIO_3 + 5\ KI + 3H_2SO_4 = 3K_2SO_4 + 3H_2O + 6I$$

Whence 5 Zn = 2I or 0.1 grm. Zn = 0.407,799 grm. I (*Ztschr. anal. Chem.*, **29**, *253–266*) J. F. G.

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* It is better at once to place the zinc in a flask of suitable size so as to avoid the transfer. J. F. G.

Abstracts of American Patents Relating to Chemistry.

(*From the U. S. Patent Office Gazette.*)

Issued December 2, 1890.

441,803.—Preparing acidulated oil. H. Nordlinger.

A process of obtaining a homogeneous mixture of fatty oil and vinegar free from water and other impurities, consisting in first mixing the oil and vinegar, next adding a salt soluble in water to throw down the water and other impurities from the oil and vinegar, and afterwards separating by decantation the acidulated oil from the impurities and saline liquid.

441,853.—Manufacture of varnish. B. Piffard.

A varnish consisting of colophonate of lead, wax or waxy matter, and a solvent.

441,941.—Gas producer. J. W. Culmer.

441,945.—Red dye. C. Dreyfus.

Prepared by combining diazotized dehydrothioparatoluidine sulphonic acid with beta naphthol.

442,016.—Process of treating ore containing lead, silver and zinc. C. L. Coffin.

Issued December 9, 1890.

442,094—Sulpho compound. E. A. Baumann.

A compound having the formula $C_9S_2O_4H_{20}$, melting at 87° C., crystallizing in silvery scales, difficultly soluble in cold water, easily in hot water, ether, alcohol and benzine.

442,109.—Process of making chromates. W. J. A. Donald.

The process consists in calcining the insoluble residuum, resulting from the ordinary manufacture of chromates, pulverizing it, and then mixing this powder with chrome ore, lime, and a solution of the salt to be produced.

442,164.—Quick match. L. Bäärnhielm.

Consists of a core of twisted cotton yarn impregnated with a solution of potassium chlorate, to which is added potassium ferrocyanide, and coated with collodion and directly surrounded with an envelope of asphalt, dissolved in linseed oil or another fat oil, to which likewise is added some salt of manganese protoxide, talc and sulphur.

442,195.—Paint. J. T. McKim.

Consists of calcareous ochre, iron ore paint, litharge, argol, japan, coal tar and benzine.

442,245.—Insect powder. G. Calor.

A mixture of zinc dust and magnesium carbonate.

442,297.—Process of bleaching hair. F. G. Wiselogel.

The hair is first thoroughly washed in cold water, and then treated in a bath of hot water containing a small quantity of lime. It is finally placed in a drying apparatus, and a strong current of dry sulphurated air passed through, until it is dry.

442,369.—Blue-black dye. Leo Gans.

Derived from amidonaphtholmonosulphonic acid and tetrazodiphenyl or homologous compounds, soluble in water and nearly insoluble in alcohol, turning blue in sulphuric acid.

442,397.—Filter. H. Roeske.

442,450.—Process of making iron prints by photography. C. B. McBlair.

The material is sensitized with a solution of ferric chloride, tartaric acid, and ferrous sulphate, and after exposure is developed with gallic acid.

442,463.—Composition for fixing ink impressions. D. C. Simpson.

A mixture of plumbic acetate, potassium chlorate and cupric acetate, for treating paper and the like to render writings or markings indelible.

442,490.—Process of making fertilizer from sewage sludge. C. H. Morgan.

442,493.—Apparatus for the manufacture of wood and oil gas. G. Ramsdell.

442,593.—Food product. A. W. Rehnstrom.

Consists of dry and roasted whey and milk.

(*Issued December 16, 1890.*)

442,600.—Apparatus for utilizing waste gaseous products. E. Biedermann and E. W. Harvey.

442,601.—Apparatus for filtering water. J. H. Blessing.

442,602.—Water filtering apparatus. J. H. Blessing.

442,613.—Regenerative gas lamp. L. A. Cooper.

442,625.—Ammonia still. F. Kaiser.

442,628.—Apparatus for dyeing hides. J. Kristen.

442,661.—Process for desilverizing lead by electrolysis. T. D. Bottome.

Argentiferous lead is subjected to electrolysis, while immersed in an electrolyte composed of ammonium salts kept saturated with carbon dioxide.

442,680.—Blue dye. M. Hoffmann and A. Weinberg.

It forms a dark greenish or crystalline powder; dissolves easily in water with a blue color ; is soluble in alcohol and insoluble in benzine or ether ; dissolves in strong sulphuric acid with a brown shade.

442,684.—Tanning process. A. F. Krueger.

The hides are subjected to the action of alum, salt, and cutch, and then to the action of bark liquor.

442,693.—Vapor burner. E. G. Mummery.

442,741.—Method of manufacturing highly sensitive isochromatic gelatine plates. H. W. Vogel.

Consists of a base, a sensitive film, and a compound of silver, and a dye or dyes held by the film.

442,802.—Process of refining hydrocarbon oils. J. Gardner and J. F. Harris.

442,867.—Preservative compound for brick, stone, etc. L. B. Drake.

Consists of boiled linseed oil, water, gasoline, sal soda, sugar of lead, and silicate of soda.

442,896.—Oil filter or separator. J. Johnson.

442,943.—Manufacture of white lead. G. Bischof.

White lead is prepared from the lead oxides of commerce by reducing them to suboxide, then subjecting the latter, mixed with water, to the action of the air, and finally subjecting the resulting product in admixture with water, sugar and acetic acid or an acetate to the action of carbon dioxide.

442,962.—Hydrometer. A. Eichhorn.

A hydrometer having a picnometer suspended from the float.

443,026.—Dye. F. C. Weiss.

The materials to be dyed are treated with anacardine extract, potassium birchromate and indigo.

443,035.—Dynamite. W. D. Borland.

A liquid nitro explosive absorbed by charred or carbonized cork.

(Issued December 23, 1890.)

443,105.—Method of preparing nitro-cellulose. G. M. Mowbray.

The process consists of three steps: first, a preliminary impregnation of the cellulose material, whether simply fibrous, felted, or textile, by crystallizing a salt, preferably sodium nitrate, in the interstices of the cellu lose material; second, immersing this dry saline impregnated cellulose material in a suitable bath of sulphuric and nitric acids; and, third, removing the nitro-cellulose from the saline acid bath, washing out the adherent acids, and drying the nitro-cellulose.

443,116.—White safety paper. A. Schlumberger.

The paper is impregnated with a resinated ferrous salt, a resin compound of plumbic ferrocyanide, and a resin compound of manganese ferrocyanide, in combination with a salt of molybdenum and a resin compound of zinc sulphide.

443,122.—Process of manufacturing gas. L. Stevens.

443,153.—Apparatus for the manufacture of coal gas. J. J. Thomas.

443,186.—Purifying water for boilers and salt making. J. L. Alberger.

443,190.—Apparatus for the manufacture of fermented liquids. H. Goetter.

443,225.—Process of preparing hydrocarbon and other oils for burning. J. H. Macy.

443,238.—Process of treating wood and fibre. W. A. Horrall.

The plants are subjected to the action of a liquid composed of water, alcohol, sugar and an acid, until fermentation subsides and disintegration is complete.

443,250.—Artificial stone. G. Buchner.

Consists of sawdust, caseine, glycerine, water glass, slaked lime, magnesia, and oil.

443,328.—Apparatus for distilling hydrocarbons. T. McGowan.

443,361.—Composition for coloring and tinting. F. W. Fewins.

Consists of water, whiting or other water color mineral, soluble glass, boiled linseed oil, and coloring matter.

443,375.—Process of marking textile fabrics. D. S. Oliphant.

A solution of potassium bichromate, mucilage and water is applied to the fabric, and after drying it is written upon with an ink consisting of aniline hydrochloride, water, mucilage and glycerine.

443,402.—Gallacetophenone. M. V. Nencki.

It is characterized by the following properties: It is a pale, yellowish crystalline substance soluble in hot water, from which it crystallizes on cooling; it is readily soluble in alcohol; in cold benzine it is practically insoluble, and only very slightly soluble in boiling benzine, but soluble in alkalies, giving pale yellow solutions, which soon turn brown on exposure to air; it melts at about 168° C., and on analysis gives figures corresponding to $C_8H^8O_4$.

443,408.—Yellow-red dye. C. Schraube.

A derivative of rosinduline sulpho acid, which appears as a reddish brown powder, readily soluble in both hot and cold water, giving a yellowish red solution. It is soluble in boiling alcohol, but insoluble in benzene. Large quantities of caustic soda or saturated common salt precipitate it from its aqueous solution. It is soluble in concentrated sulphuric acid, but precipated by dilute acids.

443,422.—Paint. J. H. Baker.

Consists of whiting, glue, alum, plaster of paris, drier, white lead, linseed oil, and water.

443,464.—Process of manufacturing steel coated wire. F. Sedgwick.

The surface of a wire is converted into steel by drawing the wire through a steelifying bath or material and heating that portion of the wire which is in the act of passing through the bath or material by means of electricity.

(Issued December 30th, 1890.)

443,549.—Apparatus for refining loaf sugar in moulds. C. Steffen.

443,559.—Process of making fertilizer from tank water. H. T. Yaryan. The tank water is evaporated to the desired density and passed through a dializer, by which deliquescent salts are removed. and finally evaporated to dryness.

443,584.—Carburetor. E. D. Self.

443,629.—Manufacture of flowers of sulphur. E. F. White.

443,685.—Process of making alum cake. H. W. Shepard. Consists in adding to sulphuric acid bauxite or other aluminous material in quantity sufficient to form a basic sulphate of alumina, adding to the hot pasty mass resulting an alkaline or alkaline earthy sulphide and mixing the same therewith in quantity sufficient to reduce the soluble iron in the mixture to the ferrous state, diluting the mass with water, separating the dissolved sulphate from the insoluble impurities of the mixture, and concentrating the solution to form the commercial aluminous cake.

443,757.—Process of reducing copper matte. J. E. Gaylord.

443,758.—Process of converting copper matte to copper. J. E. Gaylord.

443,761.—Process of purifying spent soap lyes. O. C. Hagemann. To the spent lye is added an acid and an iron salt. such as ferric chloride, and the precipitate thus formed is removed. Then acid is again added, and chlorine, the liquor is heated and air blown through it, after which the precipitate is removed and the liquor neutralized.

443,907.—Extracting oil. J. W. Evans.

443,940.—Recovering fatty products. M. L. Griffin, E. S. Thayer and E. S. Buffum. The process is for treating the residuum of scouring suds. etc., and consists in adding acid, mixing therewith a porous and granular substance in sufficient excess to retain its granular shape, and finally treating it with naphtha or carbon disulphide.

443,943.—Alloy. I. H. Johannes. Consists of more than 15% of aluminium, and less than 85% by weight of tin, antimony and lead combined.

443,951.—Apparatus for generating illuminating water gas. J. D. Averell.

443,979.—Preparing chocolate. V. Tobias and H. Fischer. Liquid chocolate is prepared by heating whey or poor milk to the boiling point, then adding a mixture of cocoa and sugar, then cooling the mixture and removing the cocoa butter. W. R.

EXCHANGES RECEIVED BY THE AMERICAN CHEMICAL SOCIETY

(*To be found in the Library*).

UNITED STATES. American Chemical Journal.
- American Druggist.
- American Gas Light Journal.
- American Journal of Pharmacy.
- American Manufacturer and Iron World.
- American Naturalist.
- Annals of the New York Academy of Sciences.
- Anthony's Photographic Bulletin.
- Bulletin of the American Museum of Natural History.
- Bulletin of the Connecticut Agricultural Experiment Station.
- Bulletin of the Masschusetts State Agricultural Experiment Station.
- Circulars of Information, Bureau of Education, Washington, D. C.
- Deutsch-Amerikanische Apotheker-Zeitung.
- Druggists' Circular.
- Engineering and Mining Journal.
- Ephemeris (Sqibb).
- Journal of Analytical Chemistry.
- Journal of the Franklin Institute.
- Manufacturer and Builder.
- Manufacturers Review and Industrial Record.
- Medico-Legal Journal.
- New Idea.
- New York Medical Journal.
- Oil, Paint and Drug Reporter.
- Pharmaceutical Record.
- Popular Science Monthly.
- Proceedings of the Academy of Natural Sciences, Philadelphia.
- Proceedings of the American Academy of Arts and Sciences, Boston.
- Proceedings of the American Philosophical Society, Philadelphia.

Reports of the Geological Survey of Pennsylvania.
Reports of the Storr's School Agricultural Experiment Station.
School of Mines Quarterly.
Technology Quarterly.
Textile Colorist.
Transactions of the American Institute of Electrical Engineers.
Transactions of the American Institute of Mining Engineers.
Transactions of the New York Academy of Sciences.
CANADA. Proceedings of the Canadian Institute.
Reports of the Geological Survey of Canada.
CHILI. Verhandlungen des deutsch-wissenschaftlichen Vereins zu Santiago.
MEXICO. Boletin del Ministerio de Fomento.
Boletin Mensual.
Informes y Documentos Relativos à Comercio, etc.
Memorias y Revista de la Sociedad Cientifica.
PERU. Boletin de Minas.
GREAT BRITAIN. Analyst.
Chemical News.
Engineering.
Industries.
Invention.
Iron.
Journal of the Chemical Society.
Journal of the Society of Arts.
Journal of the Society of Chemical Industry.
Oil and Colorman's Journal.
Pharmaceutical Journal and Transactions.
Sugar Cane.
Transactions of the Laboratory Club.
FRANCE. Annales des Mines.
Bulletin de la Société Chimique de Paris.
Bulletin de la Société Industrielle de Rouen.
Moniteur de la Teinture.
Moniteur Scientifique, Quesneville.
Repertoire de Pharmacy.
GERMANY. Archiv der Pharmacie.
Bierbrauer.
Bulletin de la Société Industrielle de Mulhouse.
Gerber-Zeitung.
Sitzungsberichte der K. B. Akademie der Wissenschaften zu Munchen.

HOLLAND.	Revue International des Falsifications.
AUSTRIA.	Allgemeine Oesterreichische Chemiker und Techniker Zeitung.
	Chemisch-Technischer Central-Anzeiger.
	Drogisten Zeitung.
	Jahrbuch de K. K. Geologischen Reichsanstalt.
	Oesterriche Zeitschrift für Berg-und Hüttenwesen.
ITALY.	Gazzetta Chimica Italiana.
RUSSIA.	Bulletin de l'Academie Imperiale des Sciences de St. Petersburg.
	Memoires de la Société des Naturalistes de Kiew.
AUSTRALIA.	Journal and Proceedings of the Royal Society of New South Wales.
	The Australasian Journal of Pharmacy.