

pages) contains 21 chapters on apparatus, operations, and reagents. Topics are laboratory apparatus, sampling, detection (qualitative), mechanical separation, separation by precipitation, separation by electrolysis, solvent extraction, separation by distillation and evaporation, chromatography, ion exchange, gravimetric precipitates, titrations, non-aqueous titrations, colorimetric and electrometric determination of pH, statistics, the microscope, quantitative micro-chemistry, quantitative organic analysis, solubility measurement, and water determination. With a few exceptions, the chapters in this section seem to be of a general or survey nature, being valuable for introduction to the topics dealt with.

The second part (24 chapters, 2007 pages) gives practical techniques for the analysis of various materials, including commercial acids and bases, air pollutants, iron and steel, ferrous and non-ferrous alloys, protein hydrolyzates (for amino acids), bituminous substances, coal and coke, cement, clinical samples, explosives and propellants, fats, fertilizers, fuel and other gases, paints, paper (including wood and pulp), pesticides, petroleum and its products, plastics, poisons, rubber and its products, silicates (rocks, glass, and slag), soaps and detergents, soils, vitamins, and water. The most commonly used methods are described in sufficient detail to permit their performance without recourse to other works. Many of the methods are those recommended by ASTM, AOAC, TAPPI, and the American Oil Chemists' Society.

The index (70 pages) is thorough. The technical quality of the whole work is good. The writing style and the printing are also of high quality, and typographical errors are few. (However, the meaning of "hydraulic calcium silicates" still escapes this reviewer.) Because the text was contributed by 67 authors, it suffers some defects. The bibliographies for the chapters are not uniform. Although they are generally good and modern, the references in some chapters are inadequate or are not tied into the text. There is also some repetition: the Karl Fischer titration is described at least five times, each time at about the

**The Fort Worth Laboratories
Southwestern Laboratories**

Since 1912

Consulting, Analytical Chemists
and Testing Engineers

Dallas
RI-2-2248

Fort Worth
ED-5-9321

Houston
CA-4-6347

same level, and directions for the calcium oxalate precipitation are given in ten different places.

The wisdom of intentionally deemphasizing instrumental methods may be questioned. However, since this deemphasis presumably will be remedied in Volume III, no judgment can be rendered at this time. Overall, however, the preceding shortcomings are trivial in a work of this size. The editor is to be congratulated on the performance of what must have been an arduous and time-consuming task. There is no other single, recent work in the English language that fulfills the same needs of the analyst as this volume does, and it should be made accessible to all practicing analysts.

W. J. BLAEDEL
The University of Wisconsin
Madison, Wisconsin

• *Referee Application*

First Notice. M. M. Phillippe, Shuey & Co., P. O. Box 663, Savannah, Ga., has applied for a Referee Certificate on oil cake and meal. The Chairman of the Examination Board should be contacted by interested parties wishing to comment on this certification. Please write to N. W. Ziels, Chairman of the Examination Board, Lever Bros. Co., 1200 Calumet Ave., Hammond, Ind.

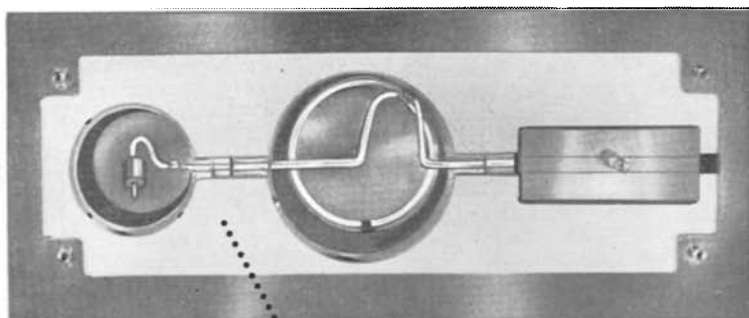
**IT'S WHAT'S
UP FRONT
THAT COUNTS!**

**SAVANT'S Model 620
GAS CHROMATOGRAPH**

HYDROCARBONS
FATTY ACIDS
STERIODS
LIPIDS

Compact, bench top system with built-in versatility complete with interchangeable columns and detectors. Makes it readily adaptable to changing research requirements. **Up front** are controls, indicators, oven openings and sample injection port for reproducible performance. The sensitivity and stability of Savant's Gas Chromatograph system, makes it suitable for the most demanding high-precision analytical determinations.

Investigate today. Write for Bulletin No. 1011/AOC, for complete details.



DETECTOR OVEN COLUMN OVEN PRE-HEATER
TOP VIEW OF OVEN ASSEMBLIES



SAVANT
INSTRUMENTS, INC.



221 PARK AVENUE • HICKSVILLE, NEW YORK

(Continued from page 39)

actuating gases, to help in the selection of suitable materials. (Rev. Current Lit. Paint Allied Ind.)

INTERFACIAL ELECTROCHEMICAL PHENOMENA OF PIGMENT/VEHICLE SYSTEMS. I. Y. Oyabu, H. Kawai and Y. Nakanisi. *J. Jap. Soc. Col. Mat.*, 35, No. 3, 98-104 (1962). The interfacial electrokinetics phenomena of rutile TiO_2 pigments in paint vehicle solutions, which are composed of alkyd resins, melamine resins and xylene, have been investigated by means of electrophoresis. Based on the Helmholtz's hypothesis of interfacial electrical double layer, ζ -potentials have been computed. The ζ -potential of TiO_2 was positive in sign in alkyd resin/xylene systems and negative in melamine resin/xylene systems. Plotting logarithms of both potentials and resin concentrations, it is observed that the points lie very nearly on a straight line. However, for resin solutions whose concentrations are lower than 3% for alkyd and 10% for melamine, the above mentioned linear relations do not hold. In pigment, alkyd resin, melamine resin and xylene systems, the sequence in which the resin solutions are brought into contact with the pigment affects the ζ -potential and viscosity of the system, i.e., when pigment and melamine resin solution are mixed previously, the viscosity is higher than when mixed otherwise. As the concentration of alkyd resin increases, the ζ -potential of the system approaches the value of that of alkyd resin/xylene/pigment systems. (Rev. Current Lit. Paint Allied Ind.)

NEW PUSH FOR POLYESTERS. Anon. *Chem. Week* 90 (2), 41 (1962). Tetrahydrophthalic anhydride is combined with fumaric acid, diethylene glycol and styrene to produce new high-quality polyester coating systems suitable for furniture, automobile and appliance finishing and possibly for paper-coating, can coating and machinery finishing. The new coatings are characterised by deep gloss without buffing, flexibility in coating thickness in single-spray application, excellent adhesion to steel and other metals, good light stability and quick cure. (Rev. Current Lit. Paint Allied Ind.)

SURFACTANT-MODIFIED CALCINED CLAYS IN ALKYD FLAT PAINTS. H. B. Naylor. *Off Dig.* 34, No. 444, 51-58 (1962). Since the first introduction of calcined clays there has been an increasing awareness of their shortcomings. Particularly, excessive quantities of these products in a given formulation tend to impair the properties of enamel hold-out, sheen uniformity, stain removal, etc. In this paper a surfactant-coated product is discussed which improves these properties and permits the use of increased amounts of calcined clays. Although only solvent systems are discussed, this work points the way towards development of products suitable for water paints. (Rev. Current Lit. Paint Allied Ind.)

CRITICAL PIGMENT VOLUME CONCENTRATION AND THE THEORY OF VOLUMETRIC RELATIONS. A. Flamm. *Peint. Pig. Vernis* 38 (6), 320-335 (1962). European as well as American work is surveyed. (Rev. Current Lit. Paint Allied Ind.)

COMMON MARKET PROBLEMS FOR THE EUROPEAN PAINT INDUSTRY. C. Hill-Madsen. *Paint J.* 14, No. 110, 475-477 (1962). The likely effect on Scandinavian industry and the role of the European Committee of Paint and Printing Ink Manufacturers are discussed. (Rev. Current Lit. Paint Allied Ind.)

DEVELOPMENT OF HEAT-RESISTANT PAINTS FOR METALS. E. Mileski and A. E. Raeber. *Southern Research Inst., Birmingham, Ala., Rept.* No. 6151-1264-IV, 13 pp., (1961); *Final Rept.* 38 pp. (1962). Progress is reported on the preparation and evaluation of air-drying heat-resistant coatings for metal surfaces. The coatings are made by reacting P compounds with metal oxides or ceramic frits. Coatings based on ZnO , dimethyl hydrogen phosphite and ethyl acid phosphate with small amounts of colloidal silica had higher gloss and were harder than the same coatings without the silica. These coatings also had excellent heat resistance. Wetting agents in metal oxide/organo-P coatings cause the coatings to blister when subjected to high temperatures. In the system ZnO /dimethyl hydrogen phosphite/ethyl acid phosphate, the ratio of

the solid to the liquid components was a major factor in determining the physical properties of the coating. Coatings made from mixtures high in ZnO and low in the liquid P compounds were brittle. Coatings made from mixtures low in ZnO and high in P compounds were soft but had high gloss. Formulations and coating procedures were developed that could produce coatings on metal substrates with any of the several properties that were desired, but it was not yet possible to obtain all of these properties simultaneously and reproducibly. The most promising coatings contain acid phosphates. The ceramic frits, some metal zirconates and bis(2-ethylhexyl) phosphite merit further study. Reaction mechanism studies indicate that dimethyl hydrogen phosphite hydrolyses and reacts with ZnO to form an amorphous polymeric product that is insoluble in organic solvents. (Rev. Current Lit. Paint Allied Ind.)

RECENT DEVELOPMENTS IN ORGANIC COATINGS. D. H. Grover. *Applied Plastics* 5, 25 (6 pp.) (1962). It is pointed out that only since the advent of completely synthetic raw materials have substantial advances in extending the range of finishes available been made. The major classes of metal finishing materials are reviewed. (Rev. Current Lit. Paint Allied Ind.)

PAINT FOR REPELLING ANIMALS. T. Yonesawa. *Jap.* 4611/62. Paint for repelling animals is made by mixing a naphthalene derivative which contains a hydroxyl or methyl radical with a solution or emulsion vehicle. E.g., 10 g. of linseed oil, 10 g. of terpene resin and 30 g. of creosote are mixed. Separately 5 g. of β -naphthol and 10 g. of methylnaphthalene are dissolved in 35 g. of methanol. Then both solutions are mixed. (Rev. Current Lit. Paint Allied Ind.)

PAINT ADDITIVES—THEIR CHEMISTRY AND APPLICATION. W. J. Stewart. *Double Liaison* 88, 77 (11 pp.) (1962). The additives considered are driers, antiskinning agents, bodying agents and fungicides. The specific performance of each additive is shown. Co and Mn are classified as active catalysts for air drying and Co, Mn, V, Fe, Ce and the rare earths for stoving, the other metals being auxiliary catalysts. Antiskinning products are mainly phenols and oximes; the former are chiefly used in dip coating. Bodying agents have three principal actions and the author describes the relationship between these actions in various kinds of paint. It follows that it is impossible to choose a single product for all paint systems. This study ends by the examination of fungicides. Hg salts are toxic; Cu 8-quinolinolate is non-toxic but imparts a greenish yellow colour to the film; thiophthalimides are very effective and have the advantage of imparting little or no colour to the paint. (Rev. Current Lit. Paint Allied Ind.)

RECENT ADVANCES IN THIXOTROPIC PAINTS. J. R. Berry. *Paint Manuf.*, 32, No. 12, 431 (7 pp.) (1962). Incorporation of thixotropic alkyds in paints leads to improved application properties, including a satisfactory combination of sag resistance and flow out. The instrumental methods employed in formulating such coatings are discussed, together with the results obtained with one particular thixotropic alkyd developed for use in undercoats. (Rev. Current Lit. Paint Allied Ind.)

SOLVENTLESS VARNISH. Meidensha Electric Mfg. Co. *Jap.* 2976/62. To prepare a solventless varnish of the epoxy-modified unsaturated alkyd resin type, an excess of a trihydric alcohol is added to a mixture of one or more saturated or unsaturated dibasic acids and hydroxy acids. The condensate so obtained is condensed with maleic anhydride in an amount more than equivalent to the remaining hydroxy radicals. The unsaturated alkyd resin obtained by reaction of the alkyd resin and the glycidyl ether is dissolved in a monomer containing vinyl and/or allyl compound. E.g., 92 g. of glycerol, 100 g. of ricinoleic acid and 100 g. of terephthalic acid are mixed and CO_2 gas is introduced until the whole is clear. Then 198 g. of ricinoleic acid and 147 g. of maleic anhydride are added. A reddish-brown viscous resin is obtained. To 100 g. of the resin 26 g. of Epikote 828 are added and 65 g. of styrene is dissolved in the mixture, which is filtered, 2% of di-tert-butyl peroxide being added to the filtrate. (Rev. Current Lit. Paint Allied Ind.)

FIRE- AND CHEMICAL-RESISTANT PAINT. Chugoku Paint Co. *Jap.* 2975/62. Fire- and chemical-resistant paint is prepared by mixing epoxy resin varnish with silicone resin varnish and heat-resistant pigment. E.g., 10% of silicone resin varnish, 70% of epoxy resin varnish, 7% of urea resin varnish and 13% of TiO_2 are mixed together. (Rev. Current Lit. Paint Allied Ind.)

Established 1904

HOUSTON LABORATORIES

Analytical and Consulting Chemists

311 Chenevert Street P.O. Box 132 Houston 1, Texas

PESTICIDAL PAINT. T. Yamamoto. *Jap.* 10,350/62. The composition consists of active principle, sublimation agent and drying oil. As the active principle, γ -hexachlorocyclohexane (BHC), hexachloroepoxyoctahydroendoindodimethanonaphthalene and naphthalene may be used, the last compound also serving as the sublimation agent. Drying oils such as linseed oil, tung oil, etc., and soyabean oil, cotton seed oil, sesame oil, groundnut oil, turpentine, copal, gum arabic, synthetic resins and so on, are used as the constituents to make a suitable form of preparation. Since the preparation becomes finely porous by the effect of subliming naphthalene as it hardens, the application to the bark of trees does not interfere with the function of the bark. *E.g.*, 0.1% BHC, 0.1% Endrin, 10% crystalline naphthalene, 2.0% turpentine and 60.0% tung oil are mixed with vehicle such as talcum powder or kaolin. The preparation applied near the holes of longhorn beetles in a tree killed all the beetles within a few minutes. When the preparation was applied to the bark of the tree in a horizontally parallel-striped pattern of 30 cm. intervals, only the beetles in the areas where the preparation was applied were effectively prevented from swarming and egg-laying. This effect persisted over one month without noxious effects upon the tree. (Rev. Current Lit. Paint Allied Ind.)

HEAT-RESISTANT COATING. C. Oda. *Brit.* 889,866. Coatings resistant to temperatures up to 2000C comprise exfoliated vermiculite, colloidal silica, ZrO_2 , TiO_2 , white cement, active carbon and a polyester resin. (Rev. Current Lit. Paint Allied Ind.)

• Detergents

DETERMINATION OF ETHANOL. I. G. Agranovich (Shebekino Combine of Synthetic Fatty Acids and Fatty Alcohols). *Maslob.-Zhir. Prom.* 29(1), 36 (1963). In the oxidation of paraffin hydrocarbons boiling in the 275-320C range, a complex mixture of organic compounds is formed. This mixture includes monatomic alcohols, ketones, glycols, keto alcohols, and hydrocarbons. After sulfating to obtain wetting agents, and because sulfating does not exceed 60%, the mixture contains a great number of non-sulfated compounds as fatty alcohols, olefins, ketones, keto alcohols, etc. In the process of purifying the sulfated product, a control method for determining ethanol in this mixture was needed. For this, a method from the literature was used, and the results compared with those of distillation. The method used involved oxidation of the alcohol with potassium bichromate and titrating the excess bichromate with Mohr's salt. Direct distillation did not give accurate results. Results of the investigation showed that the bichromate method could be used for determining the alcohol content in the sulfated product before and after evaporation, in benzene solution, and in solutions with a high alcohol content. It is necessary to dilute the solutions to be analyzed so that the alcohol content does not exceed 10%.

MONOGLYCERIDES AND THEIR DERIVATIVES. I. SOME PROPERTIES OF POLYOXYETHYLENE MONOGLYCERIDES. Shoji Miyagawa, Tatsuo Kitagawa, and Hiroshi Sone (Riken Vitamin Oil Co., Ltd., Tokyo). *Yukagaku* 12, 295-9 (1963). Polyoxyethylene derivatives of monoglyceride were prepared by addition polymerization of about 5 and 20 moles of ethylene oxide to monoglycerides synthesized from hydrogenated coconut oil, partly hydrogenated beef tallow, fully hydrogenated beef tallow or cotton seed stearins. The surface activity of these products was studied and compared with that of commercial polyoxyethylene sorbitan fatty acid monoesters (Tween). The results indicated that all of these derivatives were as good as Tween in surface activity. The 20 moles addition products were superior to Tween in interfacial tension, emulsifying power and permeability.

DYNAMIC SYSTEMS ARE USED TO PROBE BIODEGRADATION. Anon. *Chem. & Eng. News* 41 (25), 50 (1963). The ability of bacteria to degrade various sulfonated surfactants was studied using a continuous, three-stage process designed to simulate commercial waste disposal plants. Surfactant biodegradability in this dynamic system roughly paralleled the results of static tests previously reported. Mechanism studies showed that initial microbial attack on alkylbenzene sulfonates occurred at the methyl group most distant from the aromatic ring. Subsequent oxidation formed a terminal carboxyl group, and the side chain was then degraded by conventional β -oxidation.



POSITION WANTED: Egyptian Chemist (28) desires position in U.S. B.S. degree in chemistry and geology. Seven years laboratory and supervisory experience in Sugar Industry. Write to Miss Letha Faye Swope, 2206 Broadway, Lubbock 1, Texas 79401.

Wanted, refiner to refine crude cottonseed oil, batch method. Will train young chemist, if necessary. Write to Box 471, Cuero, Texas.

QUALITY CONTROL SUPERVISOR NEEDED

Challenging opportunity with old established company under new aggressive management. Expansion in fatty oil products operations requires young experienced chemist or chemical engineer to handle control laboratory and pilot plant as well as product development projects. Experience in refining, hydrogenation, shortening and margarine manufacturing essential. Work in new modern plant in midwest. Live in lovely new suburban residential development 15 minutes from plant. As independent consultants, job information will be furnished in confidence. No fees. Please reply to:

ROBERT R. KING ASSOCIATES
Preston at Sycamore
Sherman • Texas

CHEMIST PLANT CHEMISTS

Two outstanding professional opportunities with a national firm exist for Chemists, experienced in edible oils. The positions as Plant Chemist and Assistant Plant Chemist involve supervising and performing quality control, difficult analyses, and process and product improvement. The positions are available in two different plants, located in metropolitan areas.

The requirements are:

1. PLANT CHEMIST:

B.S. degree in Chemistry with considerable work in organic chemistry. Four years of experience in an industrial laboratory. Knowledge of statistics and previous supervisory experience desirable.

2. ASSISTANT PLANT CHEMIST:

B.S. degree in Chemistry with considerable work in organic chemistry. Two years of experience in an industrial laboratory. Knowledge of statistics desirable.

The men who are appointed will have the opportunity to demonstrate professional and administrative competence. Superior performance will be rewarded by salary advancement and consideration for promotion.

Please submit complete resume, in confidence, along with salary history and requirements and career goals to:

BOX 403
AMERICAN OIL CHEMISTS' SOCIETY
35 E. Wacker Dr., Chicago I, Ill.

AN EQUAL OPPORTUNITY EMPLOYER

1963 Cumulative Index to Advertisers

American Mineral Spirits Company.....2nd Cover	The Pope Testing Laboratories..... 32
V. D. Anderson Company	Robeco Chemicals, Inc.
Artisan Industries	Rose, Downs & Thompson Ltd.
Barrow-Agee Laboratories, Inc..... 30	L. A. Salomon & Bro., Inc.
Beacon Chemical Industries, Inc..... 21	E. H. Sargent & Company..... 29
Bennett-Clark Company, Inc..... 554A	Savant Instruments, Inc..... 41
Blaw-Knox Company, Chemical Plants Division	James E. Scanlon Company
R. J. Brown Company..... 15	W. F. H. Schultz, Inc.
Companhia União Fabril	Scientific Products, A Division of American Hospital Supply Corporation
Continental Can Company	Signal Oil and Gas Company..... 31
Delmar Scientific Laboratories	Skelly Oil Company..... 4th Cover
Distillation Products Industries..... 17, 18	Foster D. Snell Laboratories..... 9
Drew Chemical Corporation..... 7	Spencer Kellogg, Division of Textron Company
Eastman Chemical Products, Inc.	Fred Stein Laboratories, Inc..... 12
Engineering-Management, Inc.	Texas Testing Laboratories, Inc..... 26
Ertel Engineering Corporation	Arthur H. Thomas Company..... 13
Esso Research & Engineering Company, Enjay Laboratories	Universal Oil Products Company..... 27
Extraction De Smet S.A.	Votator Division, Chemetron Corporation
F & M Scientific Corporation	Waters Assoc., Inc.
Forth Worth Laboratories..... 41	West Virginia Pulp and Paper Company
French Oil Mill Machinery Company..... 22	Woodson-Tenent Laboratories..... 39
Fullers' Earth Union Ltd.	Wurster and Sanger, Inc..... 16A, 16B
Gardner Laboratory, Inc.	
Girdler Catalysts, Chemical Products Division, Chemetron Corporation	
Griffith Laboratories, Inc..... 33	
A. Gross & Company	
Hahn Laboratories..... 34	
Harshaw Chemical Company..... 3	
Hess Oil, Petrochemicals Division..... 1	
Hercules Filter Corporation, Division of De Laval Separator Company..... 40	
Hoffmann-La Roche, Inc..... 554B, 554C	
Houston Laboratories..... 42	
Humble Oil & Refining Company	
Inorganic Chemicals Division, FMC Corporation..... 554D	
Johns-Mansville Corporation..... 3rd Cover	
Labeconco 37	
Law and Company..... 14	
Lurgi Gesellschaft fur Warmetechnik, MHB	
Luwa Corporation	
MSA Research Corporation	
Niagara Filters, A Division of Ametek, Inc..... 11	
Northwest Orient Airlines	
Nuodex Products Division..... 5	
Ozone Research & Equipment Corporation	
Chas. Pfizer & Company, Inc..... 23, 25	
Philadelphia Quartz Company..... 8	
Phillips Petroleum Company..... 35	

Put in a Standing Order



. . . receive
your annual
**ADDITIONS
and REVISIONS**
automatically

. . . keep your
AOCS

OFFICIAL and TENTATIVE METHODS

. . . the easy way
perpetually correct and up-to-date

It's as simple as this: just drop us a note and tell us to enter your firm (or individual) name on the **STANDING ORDER LIST** for Annual Additions and Revisions, until further notice. Start now with 1963.

Also list the number of copies needed, and the address to which they should be mailed, direct from our printer. You will be billed annually at \$3.00 per copy after their receipt. Save time and trouble later. Your Additions and Revisions will be in your hands 30 days in advance of routine orders!

Write:

**METHODS DEPARTMENT
AOCS
35 E. Wacker Drive
Chicago 1, Illinois**