

ORGANOPHOSPHORUS MONOMERS AND POLYMERS, by E. L. Geffter, translated by G. M. Kosolapoff, edited by L. Jacolev (Associated Technical Services, Inc., P. O. Box 271, East Orange, New Jersey, 288 pp., 1962, \$14.75). Kosolapoff's excellent translation of the original Russian text makes this book a welcome addition to the technical literature of English-speaking nations. (Another translation has been published in England, but the reviewer has not seen a copy as yet.) The relative scarcity of review type material in organophosphorus chemistry makes this book required reading for all neophytes, and a useful supplement to the experienced worker's library. The introductory passage on organophosphorus nomenclature, complete with structural formulas, should, in spite of some inconsistencies, be especially helpful to readers who are not familiar with this aspect of the chemistry.

As the title suggests, the book is divided into two parts. The first part, entitled "Starting Materials," deals with the synthesis and properties of such a wide variety of organophosphorus compounds that nearly every class is represented. Of course, the emphasis in this section is on compounds with polymer potential, but this still affords wide coverage of types when one considers the number of functional groups which may actually be employed in polymerizations. After each type of "monomeric" organophosphorus compound has been discussed in general terms, the author then presents a detailed description of a few representative syntheses, followed by extensive listings of the physical constants of compounds in that category, together with appropriate references.

For those who are interested in molecular refractivity, there is a short chapter devoted to this subject giving many refractions for phosphorus in various oxidation states and in a variety of groupings.

The second half of the book is concerned with the polymerization or co-polymerization of the materials described in the first part. The format of this section is essentially the same as that employed in the first half with the exception that the tabulation of polymeric materials is naturally more detailed. Reaction conditions and a brief description of the product obtained are included in the tables with pertinent references. A chapter is devoted to a summary of the industrial applications of phosphorus-bearing high polymers. In addition to transparent glasslike plastics, the uses mentioned include: coatings, lacquers, films, filaments, plasticizers, adhesives, fire retardants for fabrics and resins, ion exchange resins, and lubricating oil additives.

The bibliography contains 834 references, but some duplication was noted and the actual total must be reduced accordingly. Kosolapoff states that he verified all of the references, with the exception of 22 to which he did not have access. The value of the book is enhanced by the fact that a great many of the references are to free world journals and patents.

Although the cover is inferior for this type of book, the quality of the paper and print is good, and the price does not appear to be exorbitant when the utility of the book is considered.

CLARENCE H. ROY,
The Procter & Gamble Company,
Cincinnati 39, Ohio.

INVITATION TO CHEMICAL RESEARCH, by E. Emmet Reid (Franklin Publishing Company, Inc., Palisade, New Jersey, 366 pp., 1961, \$10.60). This attractively bound volume is divided into 22 chapters and is largely a re-statement of ideas presented by Dr. Reid in his book "Introduction to Organic Research," published in 1924. This introduction to research is as timely now as it was long ago. This is an inspiring fascinating book made eminently readable by the fact that Dr. Reid presents research as a way of life as seen through the eyes of a pioneer and veteran of research. The meaning of research, its incentives, and its development in America is discussed. Dr. Reid goes on to explain where to find research problems and how to attack a problem. Chapters are devoted to the various types of research that can be carried out: The study of known compounds, remaking known compounds, and making new

NEW BOOKS

ones, research in organic analysis, the study of organic reactions, and the structures. The opportunities awaiting one who conducts medical research are explored. Dr. Reid devotes a chapter to research carried out by undergraduates and methods of selling research to students.

Since every research worker must have a certain degree of proficiency in the use of scientific literature, Dr. Reid has included in his book eight useful chapters concerning this sometimes neglected area. Various types of scientific libraries, methods of finding books, and systems of classification are covered. The need of library training, the need to learn and read foreign languages and the need to exercise caution in reading is emphasized. Uses of primary and secondary publications are explained and an instructive and timely chapter concerning the Soviet chemical literature is included. Methods for searching the general chemical and patent literature are discussed. A final chapter covers the writing and reporting of results.

This book is not a highly technical treatise on research, written for experienced investigators; it can be best described as a how-to-do-it book which will enable beginners and students to carry out research. Every topic covered is described in great detail. The book is liberally illustrated with examples from the author's experiences. Included are many quotations and contributions by key figures in American research, some written expressly for this book. This volume is essentially free from typographical errors and is well indexed throughout. References are plentiful and many recent ones are made use of.

This book will make fascinating and instructive reading for anyone involved in research at any level, although its price, unfortunately, will probably keep it from the hands of students and beginners in research who would benefit most from it.

EDWARD G. PERKINS,
University of Illinois,
Urbana, Illinois.

• *New Literature*

PACKARD INSTRUMENT Co., INC. offers Bulletin 1004, a 12 page brochure describing Auto-Gamma Spectrometer Systems for medical, biological, and chemical research. (Box 428, LaGrange, Ill.)

EASTERN CHEMICAL PRODUCTS, INC. has released a new Bulletin P-105, listing the industrial and specialty chemicals available from their company. (Subsidiary of Eastman Kodak Company, Kingsport, Tenn.)

FISCHER & PORTER Co. recently published their Condensed Catalog 163, that covers all major lines of process instruments. Included are both miniature electronic and pneumatic indicators, recorders, and controllers as well as recording and control instruments in several larger case styles. (353 Jacksonville Rd., Warminster, Pa.)

ACE GLASS, INC., now has a 32 page Mini-Lab bulletin #6200 containing 27 new items available. The glassware comes in \$ 14/20 and \$ 18/9 joints and features a full line of component parts permitting endless variations. (Vineland, N. J.)

LAPINE SCIENTIFIC Co. gives the complete details about the new LaPine-Leybold line of atom models in their 16 page illustrated booklet, entitled "Atom Models to Construct Molecular Models of Organic Compounds." (6001 S. Knox Ave., Chicago 29, Ill.)

THE HAYS CORP. has released a 4 page Bulletin B346 covering in detail the obstructionless measurement of flow of almost any liquid with the Hays Electromagnetic Flowmeter. A list of typical opaque solutions, caustics, acids, and slurries is also given in the folder. (Michigan City, Ind.)

(Continued on page 46)



UNIT PROCESSES, Technical Session N—H. G. Willsie presiding. Seated: R. S. Wayman, H. G. Willsie, and H. Niewiadomski. Standing: J. R. Reynolds, George Hoh, David Barlow, and G. C. Mustakas.

Shorter heating periods throughout the process gave a significant improvement in protein meal quality.

G. L. K. Hoh, E. I. du Pont de Nemours, presented data on the oxidation of tertiary amines with hydrogen peroxide in water and non-aqueous solvents and peroxy acids under various reaction conditions. The preferred system was hydrogen peroxide in water with addition of water during the reaction to prevent gelation. Yields and efficiencies were substantially improved by removal of impurities in the initial amine, which, if present, consumed a portion of the peroxide.

D. O. Barlow, E. I. du Pont de Nemours, discussed factors involved in the repeated use of ion exchange resin in epoxidation of oils. Wide clearance, recessed impeller, and centrifugal pumps were preferred for transfer of the resin oil slurry. Separation of the resin by centrifugation resulted in lower oil retention and less resin degradation than filtration. Methods for maintaining the desired concentration of water and acetic acid were outlined.

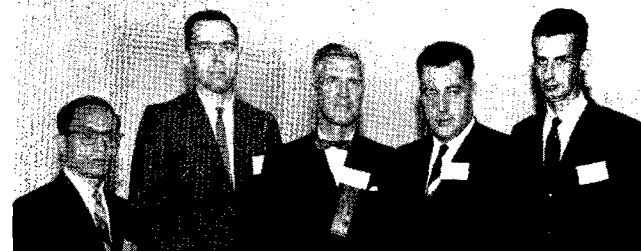
General Session

An analytical method for estimating abietic and neoabietic acids was described by W. S. Vought, Jr. These acids can be separated from fatty acids by esterifying the latter with methanol and extracting the rosin soaps with water. Subsequently the rosin acids are formed and they are estimated by measuring their absorption at 241 and 250 millimicrons.

G. E. Graham reported that the curing of oxidized drying oils for use as linoleum binders can be reduced from 60 days to 4 days by the use of polymethylol phenols as accelerated curing agents. The compound which gave the best results was the tetramethylol of Bisphenol A.

W. S. Vought presented a paper by J. S. Heckles, R. H. Reiff, and F. H. Byers on the analysis of linoleum binders. The method was described in detail and followed more or less classical procedures of saponification of the binder and separation of fillers by filtration. Beta sitosterol is determined by precipitation as the 1-1-digitonide, and ligno-ceryl alcohol is separated on an alumina column. Fatty acids, rosin acids, glycerol, and pentaerythritol are also determined.

C. K. Lyons reported that the use of blown castor oil in place of castor oil in the polyol mixture to produce rigid urethane foams increased the compressive strength of the foams. The increase in strength is in proportion to the degree of oxidation.



GENERAL SESSION, Technical Session O—R. A. Burt presiding. Left to right: R. B. Sumantri, C. K. Lyon, R. A. Burt, B. M. Craig, A. P. Tullach, W. S. Vought, Jr., and G. E. Graham. (Not pictured: R. W. Poe.)

R. W. Poe showed that much better separation of mixtures of 1-olefins, from C_6 to C_{18} in chain length, was obtained when the temperature of operation of the column was programmed from 75°C to 230°C at 9°C per minute than when the whole operation was performed at a uniform temperature. Results obtained by this means were more precise than those obtained by means of the mass spectrometer.

R. B. Sumantri presented experimental data of vapor pressures and vapor-liquid equilibrium conditions for caproic, caprylic, capric, lauric, and myristic acids and binary mixtures of adjacent members. It was shown that this data could be predicted by means of the Fenske-Myers and Supina graphical methods and extensions of them. These methods were suggested in cases where it is not possible to obtain data by experimental means.

B. M. Craig reported that a procedure formerly used to oxidize oleic acid and methyl oleate with tertiary butyl chromate or chromate-pyridine complex could be applied to the oxidation of the methyl esters of linoleic, ricinoleic and linolenic acids to produce various keto compounds. However, methyl eleostearate and methyl acetyl ricinoleate were not affected by chromate-pyridine complex. In some cases where oxidation does take place it does so with explosive violence unless the temperature of the reactor mixture is carefully controlled.

A. P. Tullock described how hydroxy fatty acid glycosides of sophorose are produced by fermentation of long-chain hydrocarbons such as fatty acids or vegetable and animal fats, and how these hydroxy acids can be converted to dicarboxylic acids.

JAOCS Thanks Session Reporters

JAOCS wishes to express its sincere gratitude to those who volunteered to report on the Technical Sessions of this memorable Fall Meeting. The presentation of the foregoing technical review was made possible through the prompt and accurate efforts of the following individuals.

- H. W. Lemon, Department of Biochemistry, Ontario Research Foundation
- W. C. Henry, Department of Biochemistry, Ontario Research Foundation
- Raymond Reiser, A and M College of Texas
- F. K. Bieri, Pittsburgh Plate Glass Co.
- C. Y. Hopkins, Division of Pure Chemistry, National Research Foundation
- N. H. Tattrie, Division of Applied Biology, National Research Council
- C. O'Sullivan, Lever Brothers, Ltd.
- Miss E. M. Kerby, Department of Biochemistry, Ontario Research Foundation
- B. E. Brown, University of Toronto
- S. J. Sourelis, Monarch Fine Foods, Ltd.
- B. Weinberg, Canada Packers, Ltd.
- C. G. Youngs, Prairie Regional Laboratory
- W. N. B. Armstrong, Department of Chemistry, Ontario Research Foundation
- B.M. Craig, Prairie Regional Laboratory, Saskatoon

New Literature . . .

(Continued from page 32)

MIXING EQUIPMENT CO., INC., has published a 20 page brochure (Catalog B-540) giving helpful tips on such subjects as how to avoid vortexing, how to do two jobs with one mixer, how to dissolve light powders, and proper mixer mounting and positioning. (170 Mt. Read Blvd. P. O. Box 1370, Rochester 3, N.Y.)

SPENCER KELLOGG, Division of Textron, Inc., now has available the 1962 Edition of their Technical Service Bulletin containing recently up-dated formulation, manufacturing and test exposure data on their water-soluble linseed oil vehicle, Linaqua. (Technical Service Dept., 120 Delaware Ave., Buffalo 5, N.Y.)

WILKENS INSTRUMENT AND RESEARCH, INC., has announced their Gas Chromatography Catalog and Accessory Sheet that is available upon request. (P. O. Box 313, Walnut Creek, Calif.)