

ALUMINUM, ITS APPLICATIONS IN THE CHEMICAL AND FOOD INDUSTRIES, by Paul Juniere and M. Sigwalt, translated from the French by Winifred C. E. Barnes (Chemical Publishing Co. Inc., 248 pp., 1964, \$15).

The authors cover three main areas: 1) The effects of aluminum on chemicals. 2) The action of various food products on aluminum. 3) Industrial applications of aluminum.

The effects on aluminum of waters, gases and atmosphere, nonmetals, metals, oxides and salts are listed systematically. These sections should be of particular interest to the design

NEW BOOKS

and process engineers who must weigh cost of materials of construction and the effects of corrosion and/or galvanic action on lifetime expectancy. The list of organic compounds and their behaviour in contact with aluminum includes aliphatic and aromatic classes of compounds, sulfur derivatives, nitrogen-containing compounds, and heterocyclics. Many of the alcoholic and phenolic compounds of high molecular weight used in the perfume and cosmetics industry, that are com-

monly transported and stored in aluminum, are listed.

The section on foods points out the large inroads made by aluminum on other packaging materials, as for example in beer cans. In the area of foods, the authors make reference to lacquered aluminum used in collapsible tubes and foils in order to prevent direct food to metal contact. One wishes that perhaps the authors could have elaborated on the effects of foods on aluminum, particularly with regard to color and flavor changes. A description of the type of packaging used in the multitude of convenience product found on the grocery, refrigerated and freezer shelves of our supermarkets which use foil, foil paper laminates and coated or lacquered foils would appear desirable.

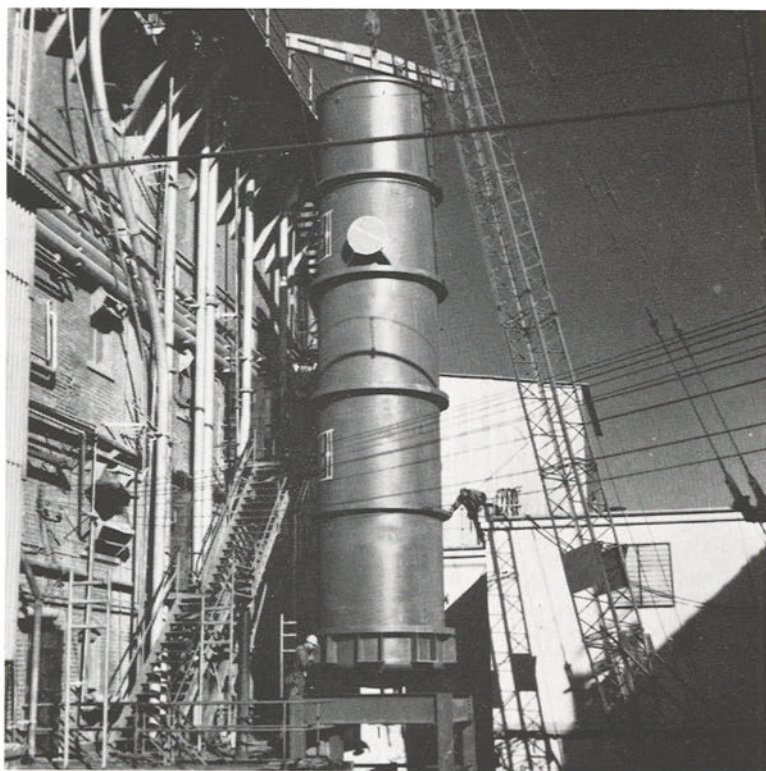
The book should serve as a reference work to the chemical process engineer.

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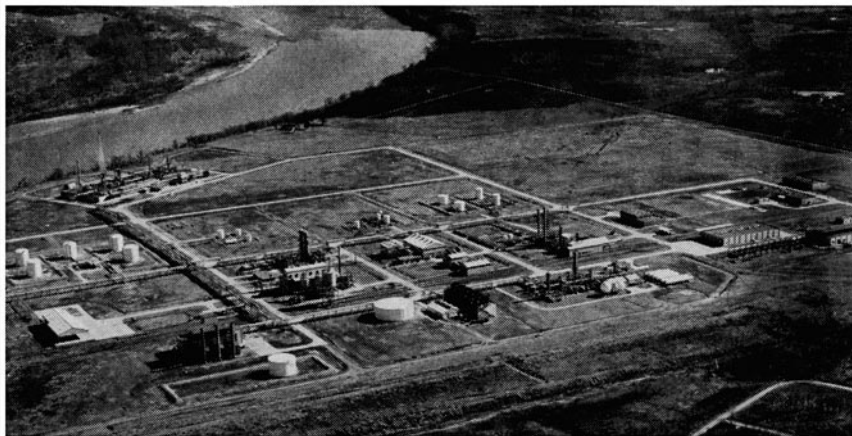
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ADVANCES IN PETROLEUM CHEMISTRY AND REFINING, Vol. VIII, edited by John J. McKetta, Jr. (Interscience Publishers, New York, 526 pp., 1964, Price \$22.50).

The book is a 5 x 8 hard cover volume in the series established by Kenneth A. Kobe and John J. McKetta, Jr. It contains chapters on Radiation Effects on Lubricants, Theoretical Aspects and Practical Implications of Static Electricity in the Petroleum Industry, Advances in Hydrocracking, Dewaxing with Urea, High Temperature Technology, the Polymethylbenzenes, and Engine Evaluation of Fuels and Lubricants. Each chapter is written by experts in their field from industry, primarily the petroleum industry. The topics are very timely since the petroleum industry is currently very actively concerned with all of them.

As with the previous volumes of this series, this book is heavily tipped toward practical applications. However, a brief discussion of the theory involved is included at the beginning of each chapter for those topics in which a generally agreed upon theoretical picture has been developed. In most chapters large amounts of useful data are presented to assist the reader in getting a true feeling for the subject. The up-to-date treatments of the topics as well as the extensive experience of the authors in their fields makes this an excellent reference for learning the current state of the art in each topic treated.

The book is written primarily for technically trained people who have some familiarity with the petroleum industry. Otherwise, many of the terms, data, discussions, and implications may be difficult to understand. Its primary use would be to familiarize the petroleum chemist or engineer with areas of petroleum technology in which he may not be particularly ex-



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pert. Thus, it serves as an excellent reference either for the man entering for the first time one of the specific fields covered or for the man returning to one of these fields after an absence of some years.

In general, the book is well written and easy to read. Like the other volumes in the series, it is an excellent addition to the reference library of any petroleum chemist or engineer.

R. B. LONG
 Esso Research and Engineering Co.
 Linden, N. J.

IDENTIFICATION AND ANALYSIS OF SURFACE-ACTIVE AGENTS BY INFRARED AND CHEMICAL METHODS, by Dieter Hummel (translation by E. A. Wulkow). Two Vols. Text Volume xiv, 386 pp.; Spectra Volume 466 Spectra, 8 Correlation Charts (Interscience Publishers, A Division of John Wiley & Sons, New York).

Until recently, a fatty acid or lipid chemist seeking information for the interpretation of infrared absorption spectra or means for ascertaining correlations between observed absorption bands and functional organic groups, would be referred to specific articles in the technical literature. During the past few years, texts dealing specifically with these subjects, but covering or attempting to cover all types of organic molecules, have appeared. Now we see complete texts dealing with applications and interpretations of infrared absorption spectra relating to only a single area—in the present case surface active agents.

Hummel's text deals with the infrared and chemical identification and analysis of what Wulkow's translation terms "Tensides." A "Tenside" is a substance which when dissolved produces a solution possessing, compared to the pure solvent, a changed surface tension (against air) or interfacial tension (against any second phase). "Tenside" thus includes such terms as detergent, syndet (synthetic detergent), and surfactant (surface active agent).

A short (6 pages) introduction reviews very briefly older methods of chemical analysis and first attempts to use spectroscopic methods for the analysis of tensides. The text volume contains seven chapters, 244 pages. The first three chapters are brief (34 pages). Chapter I discusses the complexity of tensides arising from the fact that today there are several thousand different trademarks of surface-active agents, composed of some hundred chemically different substances. Molecular or ionic structures are tabulated under five main groups, Surface-Active Anions, Surface-Active Cations, Surface-Inactive Ions, Nonionic Hydrophilic Groups, and Lipophilic (Hydrophobic) Groups. This chapter concludes with a brief discussion of the structure of the tensoid and the surface activity and a general relation between structure and specific use.

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New Books

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Chapter II introduces two systems of nomenclature or systematology, the "letter-number" system and the "decimal" system. These systems are described with illustrations in the text and a complete systematology of tensides by each system is presented in tables at the end of the volume. Chapter III deals with the electrochemical properties of tensides, discussing the different methods for determination of electrochemical behavior as applied to the analysis of anion and cation tensides, amphoteric tensides and ionic ethylene oxide adducts.

The use of absorption infrared spectroscopy for the identification of tensides is the subject of Chapter IV, the longest chapter (141 pages) in the text. After a very brief description of the principles of infrared spectra emphasizing particularly the identification of specific functional groups and group frequency correlations, this long chapter deals systematically, along the "letter-number system" with the various classes, subclasses and subclasses of tensides. As each class is discussed, reference is made to its infrared absorption spectra in the spectra volume. The infrared spectra are interpreted with emphasis on group frequency assignments and features

which identify the specific subclass. The systematic approach is continued throughout the entire letter-number systematology for all the various types and subtypes of tensides, constituting an analysis of each of the 466 spectra in the spectra volume.

Emphasizing the principle that infrared absorption spectra, as useful as it can be, as adequately illustrated, should not be the sole criterion for identification of tensides. Chapter V deals with chemical reaction for determining specific structural characteristics. Chapter VI considers combination of chemical and spectroscopic methods for quantitative identification, and Chapter VII deals with the chemical method of quantitative analysis of tensides.

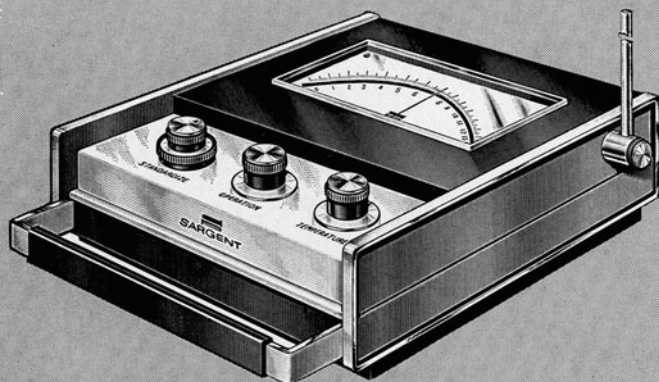
Following the text are 20 tables (114 pages) in which the various tensides are listed systematically in accordance with the structural or functional groups under two systems (as described above), a lengthy list of commercial tensides including their manufacturer, use, composition letter-number index number, and infrared spectrum number (in the spectrum volume), chemical methods for testing and quantitatively determining different tensides, and shorter tables listing separation processes for tensides, methods of testing for electrochemical behavior, dependences of reaction, precipitation on pH and other properties such as refraction index tests of the various tensides with iodine, fatty acids of alcohols, potassium permanganate tests for unsaturation, biuret reaction for protein derivatives, etc. The text is well written and the material well arranged. The tables at the end of the text volume present a wealth of information regarding tensides. The spectra in the spectra volume are beautifully printed, can be read clearly with ease, and they are well indexed to the text volume. One concerned with any aspect of the identification or quantitative analysis of tensides can hardly afford to be without this rather exhaustive treatment of chemical and spectrochemical (infrared) procedures. Its usefulness is, probably, not restricted to the worker engaged with tensides chemistry. The large collection of infrared absorption spectra and the detailed analysis of these spectra will undoubtedly be of interest, and very likely of some value to any worker actively engaged in infrared absorption spectroscopy.

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TECNOLOGIA CHIMICA INDUSTRIALE DEGLI OLI, GRASSI E DERIVATI (Chemical Industrial Technology of Oils, Fats, and Derivatives), by G. B. Martinenghi. 3rd ed. (Ulrico Hoepli, Milano, Italy, XXIII, 1130 pp., 1963, L. 15,000).

During the time since the 2nd edition appeared (1948), technological progress has produced "enormous ad-
(Continued on page 204A)

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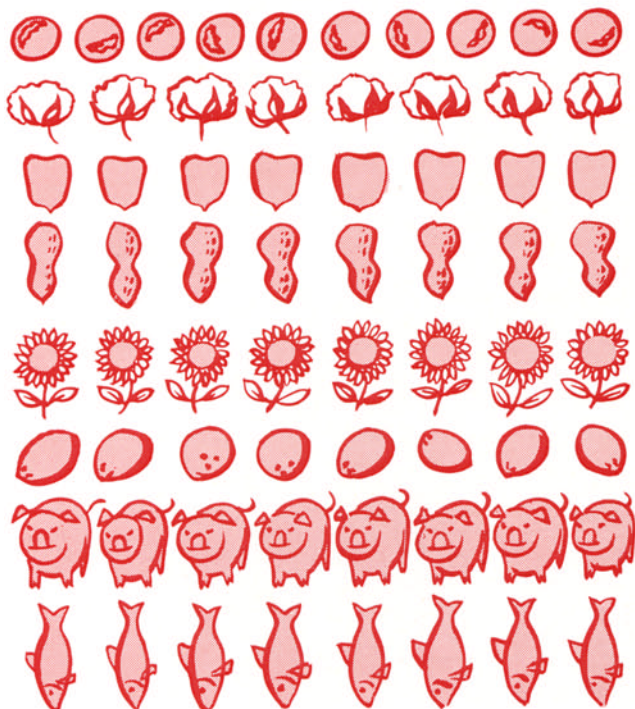
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New Books

(Continued from page 184A)

vances" as declared in the author's introduction. New industrial and analytical procedures were added to "classic" ones or substituted for them. Fatty materials have furthermore attained importance as raw sources for the chemical industry, and through the manufacture of new products they extended their applications in fields even very far from the traditional ambit. Considering that the author has taken in account this progress, the present 3rd edition is not only enlarged and updated but almost completely rewritten. The literature references are exhaustive and up to date (to 1962). The book's coverage is generous, with over 1,000 pages; notwithstanding that, it compresses sufficient material for an encyclopedia.

The book embraces four general subjects: the chemical and physical aspects of fats; their production; their botanical origin, classification, chemical and physical characterization, as well as monographic descriptions of the most important oils and fats; and the products derived from their modification.

Particular attention is devoted, in the first part, to the constitution of natural fats with the documented description of the various and most recent distribution theories. The second part, dealing with raw oils and fats production and refining, was subjected to a remarkable revision, on the basis of the new technological advances, including a description of new plants. In the third part, the several tables of the systematic data on botanical or zoological origin, fat content, oil and fat characteristics of all vegetable and animal triglycerides bearing raw materials, cover the remarkable extension of over 200 pages, including up-to-date information on many gas-chromatographic compositions of mixed fatty acids. The interest of the reader will likely be drawn by the fourth part on "fat derivatives," the concept and distribution of which, through a logical sequence of arguments, appears to be novel in treatises of this kind; it is principally based on the improvements of fat chemistry in these last 20 years.

The following subjects are described in logical order: glyceride fractionation; isomerization; radical interchange, interesterification, acidolysis, alcoholysis, superalcoholysis, monoglycerides; glyceride splitting; fractional and molecular distillation of fatty acids; fatty acid separation and fractionation by crystallization; glycerin recovery; esterification; polymerization, copolymerization; pyrolysis; oxidation (autoxidation; artificial oxidation); halogenation; de-halogenation; oils for coatings (drying theories; etc.); hydrogenation; dehydrogenation; fatty alcohols; sulfation, sulfonation; soaps, other detergents (this chapter may be unduly long with its 167 pages in comparison with others); and other fat derivatives. The most generally used reference tables and the very well detailed author, botanical names and subject indexes close this excellent treatise by Martinenghi, whose international recognition was already affirmed through the previous editions. The utility in every detail of this book is evident; its binding, chiefly in comparison with the previous editions, is commendable.

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AN INTRODUCTION TO POLYMER CHEMISTRY, by W. R. Moore (Aldine Publishing Co., 270 pp., 1963, \$7.50).

From hard experience readers have learned to be rather skeptical of claims for books made in the blurbs on their dust jackets. However, the present volume, which the jacket says is "a compact and authoritative introduction to the rapidly expanding field of high-polymer chemistry," not only justifies this description but also is surprisingly comprehensive and lucidly written. Indeed, the author has managed to include within the confines of this small volume a useful amount of information on practically all significant concepts, principles, techniques, processes and products encountered in polymer chemistry. The viewpoint is strictly chemical rather than technological.

Following an introductory chapter in which a number of

fundamentals are presented, three chapters cover principles and mechanisms of polymerization, structure and properties of polymers, and the interaction of polymers and liquids. The depth in which the last topic is discussed is one of the unusual features of the book. The remaining four chapters are devoted, respectively, to discussion of addition polymers, condensation polymers, inorganic and semi-inorganic polymers and naturally occurring, organic high polymers. The book is written as a textbook, not as a treatise or collection of reviews. In keeping with this plan, references to original literature are greatly minimized in favor of suggestions for recommended reading in more specialized or detailed monographs.

The book measures approximately 6 in. x 9 in. Printing and binding are good, and no typographical errors were noted. The subject index provided appears to be adequately detailed.

Although intended primarily for students, the book should be valuable to any chemist desiring general knowledge and understanding of polymer chemistry.

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LIPID TRANSPORT, by H. C. Meng, Ed. (Charles C Thomas, Publisher, Springfield, Ill., 256 pp., 1964, \$10.50). This book represents publication of the proceedings of an international symposium on lipid transport held at Vanderbilt University, School of Medicine, Nashville, Tennessee, Oct. 10-11, 1963. The preface of this book expresses clearly the editors' philosophy in developing the subject matter of the symposium which was to concern itself with "lipid transport—with special emphasis on the correlation of the morphological studies (of lipid transport) with the biochemical and physiological findings." The symposium (and therefore the book) is divided into four major areas: intestinal absorption of lipids, regulation of plasma lipids, lipid transport in adipose tissue, and lipid transport in the liver. Thirteen well-written papers describe and summarize current concepts in these areas. Each paper was written by an authority in the particular field under discussion and therefore reflects to a considerable extent the current research interests of each author and yields to the reader insight into the research now being conducted in these important areas.

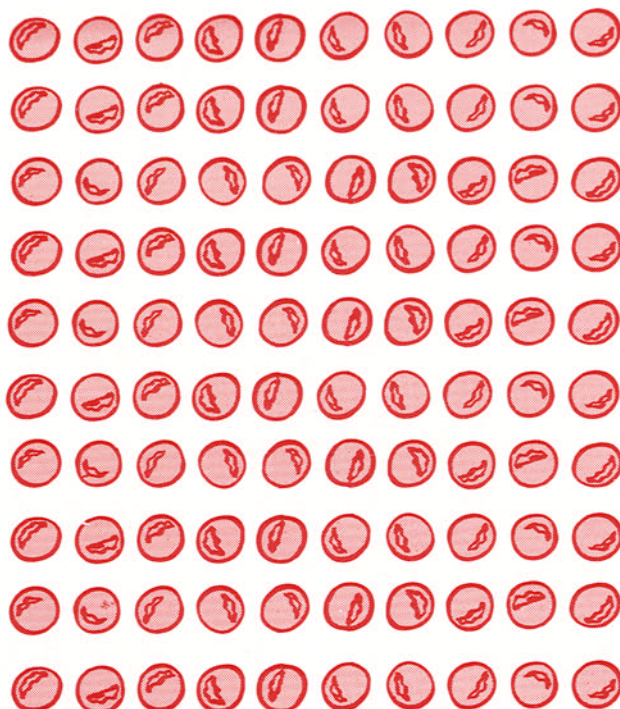
The table of contents describes in detail the titles of presented papers and the name of participating discussants. The book contains an index of discussants, an author index, an index of symposium registrants, and a subject index. The subject index appears to be fairly comprehensive, but could have been made more so by indexing in a more complete way the material covered in the discussion following each group of papers. This material, some of it very pertinent, is otherwise difficult to obtain.

The authors have listed comprehensive bibliographies at the end of each paper but inconsistencies in the inclusion of references in the discussions are evident. The inclusion of pertinent literature references in the discussions by the discussants when published material is cited would have increased the usefulness of the book considerably. However, although the lack of references and inadequate indexing of the rather extensive discussion (ca. 85 pages) somewhat limit the usefulness of the book, the inclusion of the discussions contain a wealth of material and contribute greatly to the overall value of the book as a reference tool.

Renewed interest in lipid transport is evident in the increased number of recent publications concerning lipid transport as well as the appearance of another book dealing with the subject. The book under review can be generally highly recommended to chemists interested in the problems of and methods of approach currently employed in lipid biochemistry. This reasonably priced book would be useful to and should find a place in the reference library of both the person with a developing interest in lipid biochemistry who wishes an introduction to the field and the one who is actively working in the area of lipid transport.

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