NEW BOOKS

NEWER METHODS OF PREPARATIVE ORGANIC CHEMISTRY, Vol. II, ed. W. Foerst, translated by F. K. Kirchner (Academic Press, Inc., New York, 417 pp., 1963, $14.50). This volume consists of articles on various specialized topics in preparative organic chemistry which appeared originally in *Angewandte Chemie*. The subjects covered are: 1) syntheses with acetoacetaldehyde, 2) peptide preparations using reactive amides and imides, 3) preparation of long-chain carboxylic acids from cyclohexane-1,3-diones, 4) synthetic applications using ethyl 2-cyclopentanone-carboxylate, 5) ketene, 6) phosphines, 7) reduction of carbonyl compounds with complex hydrides, 8) alkylation of aromatic amines, 9) chemical synthesis of intermediates of carbohydrate metabolism, 10) amidomethylation, 11) selective catalytic oxidations with noble metal catalysts, 12) alkylation of phenols with alkenes, 13) continuous preparation of phenylsodium, and 14) lead tetraacetate oxidations.

Most of the chapters were written by established authorities in the respective fields. Several detailed typical laboratory procedures are included in each chapter, along with liberal references to the literature (including the patent literature). Much of the data is conveniently collected in tabular form. Emphasis is given to both industrial and laboratory interests.

The book is generally well produced, except for a number of trivial, but nonetheless disturbing, ommisions in the structural formulas. This volume should be available in every chemical library, and each synthetic organic chemist should certainly be familiar with it. However, this reviewer does not recommend the purchase of such a specialized and relatively high-priced book to the individual organic chemist.

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ADVANCES IN ORGANIC CHEMISTRY: METHODS AND RESULTS, Vol. IV, ed. R. A. Raphael, E. C. Taylor and H. Wynberg (Interscience Publishers, John Wiley and Sons, New York, 361 pp., 1963, $14.50). This latest volume of the series consists of three chapters which deal with 1) enamines, 2) synthetic methods in the carotenoid and vitamin-A fields, and 3) the coupling of acetylenic compounds.

In the introductory chapter J. Szmuszkovicz describes the preparation, properties and reactions of enamines. The value and wide versatility of enamines in synthetic work, particularly in attaining selectivity in alkylation and acylation reactions, is beyond question. This is the first extensive review of the subject in English and is a welcome addition to the chemical literature. The literature coverage is extensive and, through the aid of an addendum, is current through the end of 1962, with some references from early 1963 also appearing. Experimental procedures for the preparation, alkylation and acylation of enamines are included. Major emphasis is given to the use of enamines in achieving selective synthetic reactions. Consequently, less thorough coverage is given to the various oxidative methods for preparing enamines.

In the second chapter O. Isler and P. Schudel summarize the principal methods used in the synthesis of carotenoids and vitamin A. Discussion is limited to the tetraterpenoid-polyenes and does not deal with the synthesis of higher or lower isoprenologs of β-carotene, of carotenoids with additional alkyl substituents, of desmethylcarotenoids, or of polyenes with an arrangement of methyl groups different from that of lycopene, vitamin A, or β-ionone. The various chain lengthening methods are summarized, as well as the methods for preparing the C_8–C_{30} symmetrical intermediates used for carotenoid syntheses and the methods which lead to the full C_{40}-carotenoid skeleton. The chapter concludes with a brief discussion of some selected reactions on the carotenoid or vitamin-A skeleton (dehydrations, allylic rearrangements, protropic rearrngements, reductions, and oxidations). Unfortunately, only literature through the middle of 1961 is covered in this review.

The volume concludes with an excellent review of the coupling of acetylenic compounds by G. Eglinton and W. McCrae. Attention is devoted to the coupling of terminal acetylenes in the presence of copper salts (Glaser coupling), the unsymmetrical coupling of terminal acetylenes with 1-bromoacetylenes (Cadiot-Chodkiewicz coupling) and the coupling of the Grignard derivatives of terminal acetylenes. Typical experimental procedures are described and numerous applications are discussed. Literature coverage extends to the end of 1961, but a few subsequent developments are surveyed briefly in an addendum.

The presentation in each chapter is excellent, and extensive literature data are presented in readily accessible tabular form. The book is a valuable reference source for the three areas which are reviewed, and every laboratory engaged in organic research should have this volume available.

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COLLOIDAL SURFACTANTS. SOME PHYSICOCHEMICAL PROPERTIES, by Kozo Shinoda, Toshio Nakagawa, Bun-Ichi Tamamushi and Toshizo Isemura (Academic Press, 288 pp., 1963, $11.50). This book has four chapters dealing with 1) The Formation of Micelles (96 pages, 327 references), 2) Physiochemical Studies in Aqueous Solutions of Nonionic Surface Active Agents (82 pages, 103 references), 3) Adsorption (72 pages, 136 references), and 4) Monomolecular Layers (40 pages, 69 references). The authors achieve their stated objective of making the results of Japanese surfactant research more readily available by emphasizing the work done in that country and by giving numerous references to work found in some of the lesser known Japanese journals. Although published in 1963, work beyond 1960 is not included.

Chief advantage of this book over other recently published texts on surface phenomena is that it emphasizes the solution properties of *surfactants* and not the property itself. In so doing, however, the theory and principles underlying the properties are sometimes neglected; this is particularly true in chapters three and four.

Chapter I is an outstanding summary of current theory and experimental data regarding the formation of micelles, micellar properties, and the variables influencing the many solution properties of surfactants. Although the authors clearly favor the pseudophase separation model of micelle formation, they do point out its limitations to the reader. The experimental data given in this chapter are invaluable.

Chapter II summarizes much of what was known prior to 1960 about presumably well-characterized nonionic surfactants having a polyoxyethylene chain as the hydrophilic group; much has been published on nonionics since then. Included are discussions of their micellar properties, clouding of the solutions on heating, solubilization properties, and their purification and analysis. Although the authors stress the need for working with pure nonionics, they are perhaps not sufficiently critical when presenting data which may suffer from inaccuracy of method or hydrolysis of surfactant (i.e., p. 126).

Although both colloid theoreticians and experimentalists should benefit from reading this book, it also provides a good introduction to the solution properties of surfactants for those new to the field. In general, the authors have done a commendable job of summarizing and referencing work done on colloidal surfactants—a difficult task which colloid chemists can appreciate.

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AN INTRODUCTION TO CLAY COLLOID CHEMISTRY, by H. van Olphen (Interscience Publishers, xvi + 301 pp., 1963, $10.00). The unique properties of clays have been exploited by man since time immmemorial and continue to play a major role in many aspects of his life today. From oil well drilling to paper coating, soil conservation and ceramic manufacture the art of utilizing and improving clay-water systems by proper attention to raw materials and the judicious use of additives has been flourishing for

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New Books . . .

(Continued from page 42)

a long time. In contrast to the art however, the science of it is rather recent and often uncertain or incomplete. These limitations of the science of clays are due mainly to the intrinsic complexity and variety of these systems and not to the absence of a sound basis. The principal factors involved in the structures, in their interactions, in the effects of additives as well as their relation to gross properties are explained by van Olphen simply yet correctly and in sufficient detail to guide the solution of many an applied problem. The following statement about surfactants may serve as an extreme example of the author's down-to-earth style: "Because of the dual character of the molecules, they feel most happy in the interface, where both parts of the molecule can satisfy their preference for either medium. Or, to put it more scientifically, though not more clearly, their accumulation in the interface is energetically and entropically preferred" (page 178).

After a brief survey of clays and clay suspensions which brings out the importance of colloidal factors in their behavior, the author devotes 40 pages to a review of the principles governing flocculation and peptization in general. Not a single differential equation appears here, but 14 graphs and figures make clear the relations involved. On the other hand the reader interested in quantitative calculation will find in the Appendix 30 pages of formulas and tables to serve as a unique guide dealing especially with the often-neglected systems of constant surface charge for which bentonite is perhaps the best known example.

The body of the book continues with a survey of clay structures and then uses the principles thus developed to explain the peculiarities of their behavior. Throughout, the author emphasizes the dual nature of clay particles—especially prominent in the montmorillonites—the tremendous expanse of negatively charged faces of the basic leaflet combined with the small but positively charged edge along the whole circumference. The effect of various additives, inorganic and organic, monomeric and polymeric, are reviewed with incessant applications interpreting the art of clay technology. A final chapter discusses electrokinetics and electrochemistry with special emphasis on the pitfalls of interpretation in terms of single ion activities and membrane potentials.

Between the last chapter and the Appendix there is a 28-page "Synopsis" in which the chapters are successively summarized. This may be in fact a good starting point for many readers.

The book does not pretend to exhaust any aspect of the subject and there are extensive bibliographies at the end of each chapter and an additional one in the Appendix. However—and this is the main complaint of this reader—many of the experiments briefly described in the text are not referenced so that further details, needed for a critical evaluation, are not available. Some of them I recognized as stemming from the hard-to-get Ph.D. Thesis of the author (Delft, 1951); others may perhaps be unpublished, but in any case, the reader should be told whether an original description is available and if so, where it can be found.

The book is very nicely produced and the microphotographs are a pleasure to look at. Misprints are few, but one is serious enough to need correction in every copy: In Table 2, p. 36, mole/liter should be millimole/liter.

Altogether, this book should be a boon to the technologist looking for clear guidelines to help him solve his complex problems as well as to the theoretician wishing for some reassurance that his theories have worthwhile applications and that they can be communicated in clear and simple terms.

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Fatty Acid Producers' Report

March production of animal, vegetable and marine fatty acids totalled 41.8 million lb, up 4.5 million lb from February, and up 4.0 million lb from March 1963. Inclusion of tall oil fatty acids put the March production total just above 64 million lb.

Disposition of fatty acids amounted to 43.8 million lb, compared with 40.6 million lb in February and with 40.5 million lb in March last year.

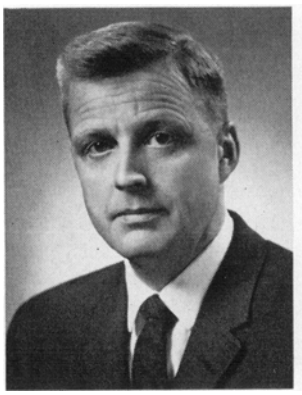
Finished goods inventories totalled 32.4 million lb on March 31, ca. 0.4 million lb below the February 28 level. Work-in-process stocks figures are not available.

• *Industry Items*

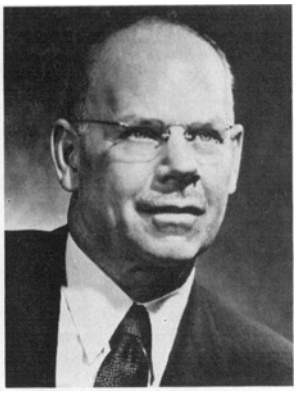
California Chemical Company, San Francisco, Calif., will have their Oronite Division's plant for the production of biodegradable "soft" detergent alkylates on stream soon at Richmond, Calif. Calchem has developed two grades of materials to meet manufacturers' needs for a wide range of both liquid and granular detergents.

Technical Measurement Corp., North Haven, Conn., has opened a new Regional Office to serve the West. It is located at 837 Cowan Rd., Burlingame, Calif., under the direction of A. S. Klein, newly appointed Regional Sales Manager.

Griffith Laboratories, Inc., Chicago, Ill., elected the following officers at the recent annual meeting of their Board of Directors: C. L. Griffith, Chairman of the Board and Chief Executive Officer; F. W. Griffith, President; H. L. Gleason, Vice President, Sales; D. L. Griffith, Vice President and Treasurer; H. A. Levy, Vice President; A. E. Maren, Vice President; Louis Sair, Vice President, Research; and R. N. Crider, Secretary.



A. S. Klein



F. W. Griffith