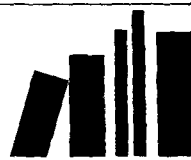


New Books

J.F. Gerecht, Book Review Editor



Alicyclic Chemistry, Volume 4, by W. Parker, Senior Reporter (The Chemical Society, Burlington House, London, 1976. 511 pp., \$75.75).

After recovery from the shock of learning that a book of 511 pages costs over \$75, this reviewer was extremely pleased to note that *Alicyclic Chemistry*, Volume 4, maintains the same high quality and completeness of coverage of the previous volumes. The survey of the literature of 1974, the period covered by this volume, is indeed outstanding but, more importantly, the interpretation of many of the reactions that were described in 1974 is most welcome. The senior reporter and his collaborators have not been satisfied with merely documenting new literature but have done an outstanding job in organizing and interpreting it. The scope of this volume is indicated by listing the chapter titles: Chapter 1: Three- and Four-membered Rings by S.A. Matlin; Chapter 2: Five- and Six-membered Rings and Related Fused Systems by D.G. Morris; Chapter 3: Medium- and Large-ring Compounds by E.J. Thomas; and Chapter 4: Bridged Carbocyclics by J. Carnduff.

Although none of the chapters explicitly deal with lipids, the vast range of chemistry that is discussed is applicable to many areas in the lipid field. For example, three- or four-membered ring compounds are very important in lipids as are larger-ring cyclic systems and mono- and poly-unsaturated compounds. All of these classes of compounds received detailed discussion in the current volume. Any lipid chemist worth his salt should be able to extract numerous viable ideas for high quality organic chemical research for application to long-chain compounds. Every library should have a copy of this book (if they can afford it). The book is remarkably free of typographical errors, it is laid out with exceptional clarity, and the subject and author indexes are excellent. The senior reporter in particular and his collaborators deserve considerable credit for maintaining the high quality of the earlier volumes in Volume 4.

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Foams. Theory and Praxis of Their Formation and Destruction (Russian). V.K. Tikhomirov (Khimiya Publ., Moscow 1975. 263 pp. Price Rub. 2.34).

Not many textbooks on foams have been published in any language, and this volume seems to be the first in the Russian. The reviewer was ready to give it a warm welcome, but changed his mind after an inspection.

The book contains four parts—The theoretical basis of foam formation, Methods of foam investigation, Practical utilization of foams, and Foam formation and foam inhibition in some branches of industry. The basic sciences (i.e., parts I and II) occupy about 40 percent of the text. Over 650 references are included so that the literature survey is nearly as complete as in the reviewer's monograph ("Foams," 1973) containing over 1,000 references.

Because not a few of these papers are, in essence, reports on laboratory tests of a small general validity, the book writer should carefully remove the chaff, standardize the chaotic nomenclature, and perform several other tidying up chores. This job, in the reviewer's opinion, was not well done by the author.

Examples can be found on almost every page. On page 31 it is stated that "in the process of foam destruction, a decrease in the surface area is accompanied by a simultaneous decrease in the foam density" although, a few lines earlier, it is emphasized that this density may increase whenever the rate of bursting exceeds the rate of drainage. The number of Plateau borders is said (page 67) to be proportional to the number of bubbles, "that is to the volume fraction of the gas" in the foam; in reality, of course, to a given volume fraction any number of bubbles may correspond. Equation (4.68) is $\alpha = \tau S_0$; α is "the quantitative criterion of the stability" of a film, and τ is the "mean lifetime of a film whose area is S_0 ." The next sentence mysteriously concludes from this relation that the film stability depends on the work of formation of the hole perimeter rather than on surface viscosity. When an attempt is made (page 79) to derive Poiseuille's equation for a plane-parallel slit, it is asserted that the velocity v (rather than the derivative dv/dx) is zero in the median vertical plane of the slit.

Probably the main error in the book is that the difference between drainage and bubble bursting is repeatedly obscured.

It seems that our Russian colleagues deserve a less confusing presentation of the science of foams.

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Food Emulsions. Edited by Stig Friberg (Marcel Dekker Inc., New York, NY, 480 p., 1976, \$48.50)

This is an excellent up-to-date reference book on food emulsion including theoretical and practical aspects of the subject. It consists of eight chapters contributed by eleven outstanding renowned scientists in the field. This book fully illustrates the unusual ability of the editor in thoroughly and authoritatively understanding the theory of emulsions and then applying this basic knowledge to solve practical industrial problems of various types of emulsions. This is therefore a most useful book for those who are interested in the theory and mechanism of emulsions, as well as for those whose research and development work deals with the practical application of emulsion, both in its formation and stability.

The contents of the book include meat emulsions, milk and milk products, ice cream, cake emulsions, association of lipids and proteins, food emulsifiers and their associations with water, crystal and liquid crystal structures of lipids, and emulsion stability.

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The Role of Fats in Human Nutrition, Edited by A.J. Vergroesen (Academic Press, 1975, 434 pp., \$36.25).

This book not only reviews the current knowledge of the physiological and pathological effects of dietary lipids, but also gives practical recommendations and examples of health policy based on such recommendations.

The book has ten well-written chapters by twelve authors. The chapters not only relate well to one another, but each is inherently balanced. The first chapter entitled, "The Role of Human Fats in Nutrition: An Introduction" was written by the editor and his associate at Unilever, J.J. Gottenbos. This opening chapter introduces the other chapters and attempts to bridge the gaps between them. The second chapter by S. Heyden of Duke University is an extensive (70 pages) presentation of epidemiological data on dietary fat intake and atherosclerosis based largely on several years of unique field experience in Evans County, Georgia. Also included are a series of recommendations based on the Evans County Study; and a most interesting speculative appendix discussing the possible side effects of dietary fats vis-a-vis multiple sclerosis, cancer, cholelithiasis, blood pressure, cigarette smoking, and uric acid concentrations. The third chapter (93 pages) deals primarily with the chemical aspects of fat malassimilation therapy and the use of medium chain triglycerides. It is written by K. Sickinger or Krankenhaus Waldshut, Waldshut, Germany. The chapter is well balanced and divided into a concise section on the physiology of triglyceride digestion and absorption, followed by a section on the clinical aspects of malassimilation.

McGandy and Hegsted authored the fourth chapter on the "Quantitative Effects of Dietary Fat and Cholesterol on Serum Cholesterol in Man". The authors present evidence for their contention that modification of dietary fat has greater potential for lowering serum cholesterol than does restriction of cholesterol intake; and report on their practical experience with lowering total cholesterol in adolescents by altering dietary lipids which, however, concomitantly lowered intakes of cholesterol. "The Role of Fat in the Treatment of Diabetes Mellitus" is Chapter 5 by A.J. Houtsmuller of Erasmus University, Rotterdam. Houtsmuller points out that a high proportion of polyunsaturated fat (up to 50 calories%) effectively lowers blood lipids more than does the standard American Heart Association fat-controlled diet. Further, a possibly important and little discussed concept is presented wherein experience with carbohydrate sensitive patients provided evidence for the lipogenic effect of sucrose being neutralized by a sufficient concentration of polyunsaturated fatty acids. It is also increasingly evident that references to low and high carbohydrate diets are of little meaning unless the precise composition of the dietary carbohydrate is known. In particular, it should be evident that the fructose moiety needs further scrutiny. G. Hornstra of Unilever presents in Chapter 6 experimental data in rats and man on specific effects of types of dietary fat on the pathogenesis of arterial thrombosis. Arterial thrombi are fibrin-poor and platelet-rich, and consequently cannot be prevented by the use of anticoagulants. Research data in rats is presented to support the view that saturated fats enhance thrombosis formation and unsaturated fats do not.

"Specific Biological Effects of Polyunsaturated Fatty Acid" is the title of Chapter 7 by U.M.T. Houtsmuller. Interesting data are provided explaining the differences between the Deuel and Thomasson Essential Fatty Acid bioassay methods because of changes in skin permeability. Further, evidence is presented indicating that for proper structural formation in liver mitochondria the incorporated fatty acid should have 19 to 20 carbons and at least four double bonds. G.S. Boyd discusses Cholesterol Absorption in Chapter 8. The contribution is valuable for its discussion of the absorption of sterols structurally related to cholesterol. Methods for the Investigation of Cholesterol Absorption are reviewed. Chapter 9 by F.C. Jager reviews the interrelationship of linoleic acid intake and Vitamin E requirement. No unique new findings are presented. Chapter 10 by R.O. Vles thoroughly reviews the nutritional aspects of rapeseed oil. Erucic acid also enters the dietary via feeds fed

to poultry, calves, and lambs. A no-effect level has not been found but the authors contend that the total exclusion from the human food is not considered essential. The subject index for the book is 15 pages long and is quite adequate. The book is recommended to all interested in the metabolism of fat.

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Separation and Purification Methods, Vol. 4. Edited by E.S. Perry, C.J. van Oss, and E. Grushka (Marcel Dekker, Inc., 1976, pp. xii + 413, \$32.50).

This volume, the fourth in a continuing series, contains ten chapters, discussion a variety of techniques for the separation and purification of chemical materials, and of varying lengths and styles of treatment. The topics covered are: "The Application of Modern Distillation Equipment in Analytical Chemistry," R.W. Yost, 21 pp.; "Preparative Isoelectric Focussing," P.G. Righetti, 50 pp.; "Facilitated Transport through Liquid Membranes," E.S. Matulevicius and N.N. Li, 24 pp.; "Programmed Multiple Development in Thin Layer Chromatography," J.A. Perry, T.H. Jupille, and L.J. Glunz, 69 pp.; "The Influence of the Size and Shape of Molecules and Particles on their Electrophoretic Mobility," C.J. van Oss, 22 pp.; "Chromatography of Non-Ionic Organic Compounds on Ion-Exchange Resins," H.F. Walton, 22 pp.; "Cycling Zone Separations," P.C. Wankat, J.C. Dore, and W.C. Nelson, 52 pp.; "High Gradient Magnetic Filtration of Magnetic and Non-Magnetic Contaminants from Water," R. Mitchell, G. Bitton, and J.A. Obersteuffer, 37 pp.; "Separation of Isotopes in Thermal Diffusion Columns," W.M. Rutherford, 46 pp.; and "Modern Countercurrent Distribution," R.A. Barford, 47 pp.

The chapter by van Oss is only peripherally related to separation, dealing with the effect of particle size and ionic concentration on the calculation of the zeta potential from electrophoretic mobility measurements. Although it contains no information otherwise unavailable in the older literature, it is probably worthwhile to have available a clear discussion of a matter which is often a vexing complication for the neophyte. The other chapters are all of interest, although I suspect that the ones dealing with thin layer and ion-exchange chromatography will be most valuable to the readers of this journal.

It is probably impossible to adequately index a book of this nature, but the subject index is not very helpful, and the author index is totally unnecessary. They both might well have been omitted. The book appears remarkably free from misprints; it is reproduced from the typescript, and, since a different typewriter apparently was used for each chapter, the result is unesthetic.

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Energy outlook by Shell

"The National Energy Outlook 1980-1990" is being offered free by its publisher, Shell Oil Company.

The 26-page booklet estimates that the annual rate of total energy growth will slow from the 1965-70 rates of five percent annually to about two to three percent annually in the 1980s. While the nation was about 16 percent dependent on imported energy in 1974, Shell ways that in 1990 about 20 percent of the nation's energy will be imported.

Copies are available from Shell Oil Company, Public Relations Department, One Shell Plaza, Room 1541, P.O. Box 2463, Houston, TX 77001. ●