



NEW BOOKS

J. F. GERECHT, BOOK REVIEW EDITOR

The Analysis of Detergents and Detergent Products, G.F. Longman (Wiley-Interscience, New York, NY, 1975, 625 p., \$33.00).

This is a paperback book divided into 20 chapters. An appendix contains basic information and chemical structures of the various types of surfactants currently used. Very complete subject and author indexes are also included.

After a preliminary introduction and a review of the historical development of synthetic detergents, the author devotes the remaining chapters to in-depth discussions of all facets of analysis. The techniques covered include qualitative examination, separation techniques, instrumental methods, and schemes for identification and analysis of unknowns. The quantitative chapters include detailed procedures for the analysis of anionic, cationic, non-ionic, and amphoteric types of surfactants. The analysis of inorganic constituents used in many formulations is described in a separate section. The author completes the book with chapters on environmental aspects, cleanser-polisher analysis, and soap examination.

The book is well organized, easy to read, and very thoroughly referenced. It fills a need in an area that has developed into an important worldwide industry.

The author, well known in the field, has been extremely thorough and has covered the complexities of detergent analysis in a laudable manner.

The book can be highly recommended. To anyone working with detergents and surfactants, the information contained in this book should prove invaluable.

R.M. KELLEY
Colgate-Palmolive Company
Piscataway, NJ 08854

Chromatography: A Laboratory Handbook of Chromatographic and Electrophoretic Methods, 3rd Edition, Edited by Erich Heftmann (Van Nostrand Reinhold Co., New York, NY, 1975, 955 p. + index, 200 illustrations, \$47.50).

This is the third edition of this ambitious work, the first two being published in 1961 and in 1966. Thirty-seven authors, most well known in their field, have written clearly on both the fundamentals and the applications of chromatography, and editor Heftmann has established a careful balance between the various branches. Thus, similar coverage is given to thin layer, paper, and column chromatography. Another feature that this reviewer liked was that the practical applications, which take up 562 pages, refer to all appropriate forms of chromatography, including electrophoresis. This enables the analyst to choose the form which suits him best, without consulting a variety of sources. However, it was disappointing that the applications contain such a low portion of high performance liquid chromatography references (18 of 232, 15 of 273, and 1 of 117 in chapters on Pesticides, Drugs, and Phenols, respectively). Affinity chromatography occupies 3 pages and has 25 references.

Compared to the second edition, the text has been enlarged 35% by increasing the number of pages, by using smaller type, and by dropping a 46 page author index. The

subject index was enlarged from 7 to 12 pages. Fifteen authors or coauthors participated in both editions, and all revised or rewrote their contribution. Half of the chapters have entirely new authors. In line with their increased importance, thin layer was enlarged from 3 to 25 pages, and high performance liquid described in a much updated 30 page section on column chromatography. A 2 page list of abbreviations is now included, but a list of symbols would have been welcomed as well.

This book has some objectives in common with the "Handbook of Chromatography" (*JAOCS* 50:233A, 1973), though the latter omits electrophoresis. The latter presents the fundamentals in more concise form and the applications in the convenient form of tables. Heftmann's *Chromatography* is more recent, more detailed, and contains many more references.

Despite the nearly 1,000 page length of this book and the increased coverage devoted to thin layer chromatography, it is pertinent to note that while Kirchner's TLC book devotes 240 pages to fundamentals, *Chromatography* falls far short of this. There are 70 pages describing adsorption and partition in general, plus 25 on TLC specifically. Specialized chromatographic techniques get scant coverage, and some fundamental aspects, such as humidity control in TLC, understandably have to be ignored. Thus, the greatest value of the book lies in side-by-side comparison of the techniques (but only the more important aspects) and in the very extensive bibliography that averages 355 references per chapter, giving a grand total of over 5,300 citations. Yet only one chapter has appreciable references beyond 1972, and the chapter on GC instrumentation has only one beyond 1969. The inevitably high cost of this book is best justified in the ease with which one can begin devising a chromatographic analysis and with which one can choose the most appropriate form of chromatography.

T. WOLF
Colgate-Palmolive Company
Piscataway, NJ 08854

Color in Business, Science, and Industry, 3rd Edition, Deane B. Judd and Gunter Wyszecki (John Wiley & Sons, New York, NY, 1975, 533 p., \$27.50).

The three part organization of this third edition is identical to that of the second edition (1963). An initial 90 page part covers "Basic Facts." It is followed by a 306 page part describing "Tools and Techniques" and a final 65 page part on "Physics and Psychophysics of Colorant Layers." The Appendix has been expanded to include four tables of definitions of terms and a table of conversion factors. The Reference Section, Author Index, and Subject Index are all well done and easy to use.

This new edition of what has long been considered the most widely used book on color should meet the needs of practically anyone who is concerned with color problems. It has been extensively revised to present an up-to-date coverage of color science and its application to color grading and measurement, color specification, and colorant formulation. Much expanded discussions of the colorimetry of fluorescent materials, metamerism, color rendering of light sources, and perceptibility vs. acceptability of color

difference all include material published since the earlier edition. A section-by-section comparison with the second edition indicates that little has been omitted, although some oil chemists may miss the detailed exposition of the Lovibond Tintometer glass controversy. Noticeable in the revisions is the use of the colorimetric terms of the International Lighting Vocabulary published by the CIE (Commission International de l'Eclairage or International Commission on Illumination). While these may be unfamiliar to some American chemists concerned with color specifications and description, their use may help resolve some semantic problems in international trade.

This book, while it may not satisfy some specialists in the coverage of their particular interests, does present an up-to-date, well-balanced treatment of those aspects of color science of importance to the chemist or engineer generally concerned with color problems. With the extensive (33 page) list of references, any reader can pursue in greater detail any of the topics particularly germane to his work. It can be recommended for anyone seriously interested in what's new in color.

The book is well produced, substantially bound, and remarkably free of typographical errors. This reviewer noted only two, one of which is a carryover of a typographical error in the second edition. Several new figures, particularly in the section on Uniform Color Scales, provide additional clarification over the earlier edition. In the preface, Dr. Wyszecski indicates that Dr. Judd's death made it impossible for them to finish the revision together, and he expresses the hope that "I have been successful in my attempt to put together a third edition which deserves bearing Dr. Judd's name." It is this reviewer's opinion that he has been admirably successful.

WILLIAM B. PRESCOTT
American Cyanamid Company
Bound Brook, NJ 08805

Handbook of Moisture Determination and Control, Vol. 4, A. Pande (Marcel Dekker, Inc., New York, NY, 1975, 328 p, \$33.00).

This is the fourth and final volume of a comprehensive monograph describing techniques for the determination of water in a variety of materials. The book is organized with a short preface followed by three chapters which describe the determination of moisture in coals and similar materials, chemicals and end products, and biological and biochemical materials. Complete author and subject indexes covering all four volumes complete the work. Specific references to the subject matter in this volume appear at the end of each chapter.

The author has brought up to date the determination of moisture in a variety of industrial materials. Most of the techniques described are abstracted from the voluminous literature available. The author, obviously an expert in the field, has done a skillful job of condensing all the available techniques into one volume. Many quite useful and unfamiliar techniques, including the use of special electronic moisture measuring devices, are described. The use of NMR is also covered. The book contains many clear and understandable illustrations and detailed circuit diagrams for some of the electrical devices.

The book can be recommended to any analytical laboratory examining the materials discussed. The value of this volume in any laboratory would be enhanced if all four volumes were available.

ROBERT M. KELLEY
Colgate-Palmolive Company
Piscataway, NJ 08854

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A Handbook of Organic Analysis, 5th Edition, H.T. Clarke, revised by B. Haynes (available from Crane, Russak & Co., Inc., 347 Madison Ave., New York, NY 10017, 1975, 291 p., \$35.00 cloth, \$16.00 paper).

H.T. Clarke's *Handbook of Organic Analysis* was a very useful if somewhat outdated text in the 1940s. In view of its prior utility, I looked forward to reviewing a drastically revised fifth edition, particularly since the last revision occurred 50 years ago. I was disappointed. This is still a manual for classical qualitative organic analysis which also contains useful quantitative methods for elemental analyses and functional group estimations.

This present edition, like its predecessor, contains chapters titled Preliminary Investigation, Examination for Radicals, Separation of Mixtures, Classified Tables of the Commoner Organic Compounds, Quantitative Determination of Constituent Elements, Quantitative Determination of Radicals, and Determination of Some Physical Properties. Chapters on The Preparation of Derivatives and Use of Spectroscopic Methods have been added.

The revised chapters still treat the subject in the classical way. For example, the second paragraph of the chapter on separations reads "Whilst specialized methods of separation such as various types of chromatography and electrophoresis are now widely used in chemical laboratories they are not considered appropriate here." This 3½ page chapter is almost identical to that in the previous edition which describes a separation scheme based on distillation and extraction with acid base and bisulfite. However, the other chapters have been revised somewhat more than this one.

The preparation of derivatives chapter describes methods for making two or three derivatives of most classes of organic compounds. The spectroscopic methods chapter is 4½ pages and treats only IR and UV spectroscopy and these in a very cursory fashion. NMR spectroscopy is conspicuous by its absence.

In organic chemistry's present state of development, when qual organic utilizing gas and liquid chromatographies and IR and NMR spectroscopies are included in first year laboratory courses, one wonders where this book will find a market.

J. FRED GERECHT
Colgate-Palmolive Company
Piscataway, NJ 08854

The Infrared Spectra of Complex Molecules, Vol. 1, 3rd Edition, L.J. Bellamy (Halsted Press, Division of John Wiley, New York, NY, 1975, 433 p., \$24.00).

The long-awaited third edition of this valuable and pioneering book is welcome indeed. The long delay was due to the publication in 1967 of what the author considers to be Vol. 2, entitled *Advances in Infrared Group Frequencies*.

Dr. Bellamy is to be commended for being able, by judicious choices, to compress the greatly expanded infrared literature into a format only one-third larger than the first edition. No attempt is made to go into details which are adequately covered by other references. The subject matter of this volume is confined to empirical methods, and the discussions, although brief and to the point, remain lucid and highly readable.

This book, in spite of its rather high price per page, should be on the bookshelf of all practicing organic chemists as an excellent guide through the many pitfalls of interpreting infrared spectra.

A.L. NELSON
Rutgers University
New Brunswick, NJ 08903

Physical Chemistry: Enriching Topics from Colloid and Surface Science, Edited by H. van Olphen and Karol J. Mysels (Theorex, La Jolla, CA, 1975, 404 p., \$6.50).

This book presents a series of essays written by a number of international authorities who were asked, according to the book's introduction, to "contribute a short theoretical presentation or laboratory experiment...preferably one of his favorite teaching gems." The result is a rather unusual, yet useful, compilation which, though obviously lacking in balance, takes the reader through an interesting and rewarding excursion into surface and colloid science. A listing of articles and authors is the best way of communicating the flavor of the book, and, since the depth of treatment varies tremendously in these highly individualistic compilations, the page length of each is included in parentheses to serve as a guide to the depth provided by each author:

Theories of the Stability of Lyophobic Colloidal Systems, H. van Olphen (12); Quantum Effects in Monolayers, H. Kuhn (10); Long-Range van der Waals Interactions, V.A. Parsegian (46); The Direct Measurement of $1/\chi$, the Debye Length, K.J. Mysels (14); Soap Bubbles and Flotation, W.H. Slabaugh (6); The Surface Tension of Liquids and Their Chemical Composition, A. Bondi (34); The Surface Tension of Aqueous Solutions of n-Butanol, A. Couper (8); Differing Patterns of Self-Association and Micelle Formation, P. Mukerjee (20); Principles of Molecular Weight Averaging and Distributions, H.L. Frisch (20); Latex Particle Size by Light Absorption, M.W.J. van den Esker and J.H.A. Pieper (6); Electrostatic Interactions in Aqueous Environments, D. Stigter (20); Coagulation Kinetics and Bimolecular Reaction Kinetics, R.S. Hansen (18); Preparation of Polystyrene Latex, M.W.J. van den Esker and J.H.A. Pieper (16); The Critical Coagulation Concentration of a Latex, M.W.J. van den Esker and J.H.A. Pieper (4); Thermodynamics of Adsorption from Solution, G. Schay (22); Thermodynamics of Electrified Interphases, R. Parsons (20); The Capillary Electrometer, Colloid Science Laboratory (10); Electrochemistry of Reversible Electrodes and Colloidal Particles, J. Lyklema (12); Electrophoresis, D. Stigter (16); Surface Conductance, A.J. Rutgers, M. de Smet, and W. Rigole (34); Thermodynamics of Irreversible Processes. Membrane Theory: Osmosis, Electrokinetics, Membrane Potentials, A.J. Staverman and J.A.M. Smit (41).

The above content indicates the range covered by the book, and the caliber of the contributors really makes any critical review of the individual articles superfluous.

For what readership is the book intended? The editors make it clear that college students and teaching professors are the target, in view of the waning interest in colloid and surface science evident from many of today's college curricula of physical chemistry. A listing of various resource materials (articles, data compilations, educational films) adds to the book's utility for this intended purpose. Since the book was sponsored by IUPAC, the rationalized, four part system of electrostatic units (part of the International System which IUPAC endorses) is employed and briefly explained in the book's preface.

The question to be answered is: Does the book have a value for the non-college student or researcher interested in surface and colloid science? My answer to this question has to be a definite "yes." While reading the entire book is a rewarding exercise, there is the great merit that any particular topic can be consulted completely out of context of the rest of the book. I found many of the articles to be illuminating and to be ones in which fundamental treat-

ments were presented in a clear, stimulating, and sometimes novel way. I am confident that anyone interested in this field will find something of value in this book.

Though fairly complete, the book will be found to have certain omissions by some readers. I, for one, would have liked to see a fuller section on insoluble monolayers. However, this is not a serious criticism, and the two editors, themselves veteran, yet ever active, stalwarts of colloidal science, deserve thanks for putting together this stimulating and modestly priced book.

E.D. GODDARD
Union Carbide Corporation
Tarrytown, NY 10591

Quantitative Analysis by Gas Chromatography, Josef Novák (Marcel Dekker, Inc., New York, NY, 1975, 218 p., \$16.75).

The theory of gas chromatography and the theoretical aspects of its use for separation and qualitative analysis have been widely discussed in the past in numerous books and publications. However, although GC has been routinely used from its beginnings for the determination of the composition of a mixture, i.e., for quantitative analysis, the theoretical aspects of this application are much less known and discussed. In fact, Novák's book represents the first attempt to present a concise treatise of the theoretical aspects of quantitative GC, properly defined by him as "a method comprising the separation on a GC column of an n-component mixture to produce n binary solute/carrier-gas mixtures, and the on-line determination of the solutes in these mixtures by a special analyzer, the GC detector." One should add that "determination" here always means "how much?" and not "what?"

The content of the book is best illustrated by describing the subjects of the individual chapters.

After an introduction, the second chapter deals with the concentration of the solute in the eluted chromatographic zone. Next, the various detectors are classified and their performance characteristics explained. This is followed in the fourth chapter by a detailed discussion of the relationships between peak area and the amount of a solute in the chromatographic band, including questions related to the linearity of detector response, and the meaning of the various relative detector responses which are then discussed in detail in the fifth chapter for six detector types. These five chapters represent the basic theory of quantitative gas chromatography.

The next two chapters deal with the various chromatographic techniques and their influence on the quantitative results. The techniques are divided into two parts: the first comprised of the "conventional" techniques, such as sample handling and introduction, chromatographic separation, peak area measurement, and the interpretation of data, while the second includes some special sampling techniques involving isolation of certain components from the matrix and head-space analysis. The latter part is particularly important; this technique is continuously growing in importance and this subchapter represents the first thorough discussion of its theory.

The eighth chapter deals with the aspects of the various methods used to establish the peak area (and height). Problems of automatic processing of chromatograms, i.e., using integrators and computers, are mentioned only briefly since—as stated—their theoretical background lies in the domain of the techniques of computerization rather than in gas chromatography. Finally, the last chapter deals with reliability of results and their statistical evaluation.

The reader of the book must have a certain skill in mathematical thinking, in being able to "think in equations," and one cannot "read" the book in the usual sense:

paper and pencil is needed to follow its discussion. This is inevitable in such a theoretical book. However, the discussion is clear and logical and not difficult to follow. The only problem I found is in the interpretation of the symbols. These are identified when they first appear and then are used through many pages without any reidentification. Thus, one often gets into a situation where one no longer remembers the meaning of a symbol and it takes some time to find it somewhere in the previous pages. In a book of this type, a list of symbols should have been added to every chapter.

The book is printed by photostatic process directly from the typed pages. The typing is very clear, although it certainly was a very complicated job due to the many symbols, single and multiple subscripts and superscripts. I could find only a few (and unimportant) typographical errors.

All in all, this is an important book. It was not written for the novice; however, even well-experienced advanced chromatographers will find much new and useful information in it.

L.S. ETTRE
Chromatography Department
The Perkin-Elmer Corporation
Norwalk, CT 06856

Soybeans as a Food Source, Revised 1st Edition, W.J. Wolf and J.C. Cowan (CRC Press, Inc., Cleveland, OH, 1975, 101 p., \$12.00).

This book is a revision and update of the first edition, which was published in 1971.

The book reviews the use of soybeans as a food source. In initial chapters, seed structure and composition, disposition of the crop produced in the U.S., and methods of processing soybeans into oil and meal are discussed. Chapters on soybean oil products and on food uses of soybean proteins follow. Emphasis is placed on the soybean proteins, with sections on the physical and chemical properties and the functional and nutritional properties of the proteins. A list of oriental and domestic foods containing soy proteins is also given.

A 21-page addendum was added in which the authors reviewed the literature from 1971 to late 1974. In the opinion of the reviewer, this section could have been more effectively combined into the original chapters. For example, the discussion on the origin of soybeans presented in the addendum could have been integrated into the discussion of the early history of soybean production. Likewise, the list and discussion of new foods containing soy proteins presented in the addendum could have been integrated into the chapter on foods containing soy proteins.

This book, containing 416 literature citations, should serve as a useful reference for anyone desiring a general reference on soybean proteins as a food source.

DALE R. ROMSOS
Food Science & Human Nutrition
Michigan State University
East Lansing, MI 48824

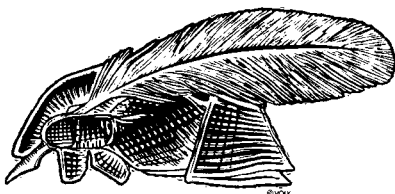
Techniques of Lipidology: Isolation, Analysis and Identification of Lipids, Morris Kates (American Elsevier Publishing Co., Inc., 52 Vanderbilt Ave., New York, NY 10017, 1972, 341 p., \$14.95).

This exceptionally useful paperback book contains chapters on: Definition and Classification of Lipids, Materials and Equipment, Lipid Extraction and Procedures, General Analytical Procedures, Techniques for Separation

of Lipid Mixtures, Radioisotopic Techniques in Lipidology, Identification of Individual Lipids and Lipid Moieties, an Appendix listing the addresses of firms and supplies mentioned in the text and 357 references. I do not know of another publication on lipid techniques which contains more valuable information presented as concisely and clearly as this book. I highly recommend it to all who are studying the chemistry and metabolism of lipids and particularly to those who are starting in the field. As indications of its value in the laboratory, my original copy is almost in pieces due to extensive use and all of my graduate students have purchased personal copies.

ROBERT G. JENSEN
University of Connecticut
Storrs, CT 06268

(Editor's note: The above book is not new, but Dr. Jensen is so impressed with it that he volunteered this review.)



NEW PUBLICATIONS

Handbook of Biochemistry and Molecular Biology, 3rd Edition, Lipids, Carbohydrates, Steroids, Edited by Gerald D. Fasman, CRC Press, Inc., 18901 Cranwood Pkwy, Cleveland, OH 44128, 570 pages, 1975, \$40.00.

Handbook of Biochemistry and Molecular Biology, 3rd Edition, Nucleic Acids—Vol. 1, Edited by Gerald D.

Fasman, CRC Press, Inc., 18901 Cranwood Pkwy, Cleveland, OH 44128, 638 pages, 1975, \$49.95.

Secondary Ion Mass Spectrometry, Edited by F.K.J. Heinrich and D.E. Newbury, National Bureau of Standards Special Publication 427 (order from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, Catalog No. C13.10:427), 1975, \$3.00.

Glass Filters as a Standard Reference Material for Spectrophotometry: Selection, Preparation, Certification, Use (SRM 930), R. Mavrodineanu and J.R. Baldwin, National Bureau of Standards—SD Catalog No. C13.10:260-51 (order from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402), 118 pages, 1975, \$1.90.

Standard Reference Materials: Standardization of pH Measurements, Richard A. Durst, National Bureau of Standards — SD Catalog No. C13.10:260-53 (order from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402), 48 pages, 1975, \$1.05.

A Taste of Science (a collection of essays written by scientists), Edited by Ralph J. Tykodi, Technomic Publishing Co., Inc., 265 W. State St., Westport, CT 06880, 130 pages, 1975, \$10.00.

Nutrition Labeling — How It Can Work for You, National Nutrition Consortium, Inc., 9650 Rockville Pike, Bethesda, MD 20014, 134 pages, 1975, \$2.00.

Atlas of Spectral Data and Physical Constants for Organic Compounds, 2nd Edition, Edited by Jeanette G. Grasselli, CRC Press, Inc., 18901 Cranwood Pkwy, Cleveland, OH 44128, six volumes, 4,688 pages, 1976, \$500.00.

Protein Resources and Technology: Status and Research Needs, Research Recommendations and Summary, Nevin S. Skrimshaw, Daniel I.C. Wang, and Max Milner (available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, GPO Stock No. 038-000-00251-1), 100 pages, 1975, \$1.75. ■

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