NEW BOOKS

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Catalysis in Micellar and Macromolecular Systems, Janos H. Fendler and Eleanor J. Fendler (Academic Press, Inc., New York, NY, 1975, xii + 545 p., $44.00).

Like the gentleman in Moliere's play who discovered that he had been speaking prose all his life, micellar catalysis has been a fact of life for all who deal in surface-active agents for as long as they have existed. For example, the acceleration of photochemical fading of dyes in surfactant-containing systems is unquestionably a micellar catalytic process. However, as an identified area of research, the concept is little more than 10 years old. In those 10 years, the Fendlers have been in the forefront of this research, and it is appropriate that this monograph on the subject should appear from their pens, the only other substantial book-form publication on the subject consisting of a series of papers delivered at an ACS Symposium.

The present book consists of 11 chapters, the first three supplying background on the preparation and purification of synthetic and naturally occurring surfactants, the physical and chemical properties of surfactants and micelles in aqueous solutions, and solubilization in aqueous micellar solutions. The treatment in these three chapters is concise and clear, but inevitably, in view of the extensive literature in the field, superficial. One could wish that the authors had resisted the temptation to include these chapters and had simply directed their readers to the extensive and reasonably complete references.

The remaining chapters deal with, respectively, the principles of micellar catalysis; micellar catalysis of hydrolyses solvolyses, and aminolysis; micellar effects on organic equilibria and nucleophilic substitution reactions; miscellaneous ionic reactions; radical and excited state reactions in micellar systems; micellar effects on hydrophobic interactions and protein structure; interactions in and catalysis by micelles in nonaqueous solvents and in liquid crystalline phases; and catalysis in macromolecular and related systems.

The book is an excellent and, as far as I can see, reasonably complete review of the published literature. A particularly attractive feature of the treatment is the extensive use of tabular representation to summarize the data. I counted 13 tables in the first three chapters, and 64 in the remaining eight. There is also an addendum, which summarizes and abstracts a number of publications which appeared after the manuscript was completed.

It was originally hoped that micellar catalysis would serve as a model system for enzyme systems, and the authors' own interest in this aspect clearly emerges from the treatment. The reviewer's own opinion is that this hope is illusory, at least in the sense of a major breakthrough. But as a route to a better understanding of reactions occurring in systems concerning surface-active agents, this book has much to offer, and there is always the hope that something of commercial significance may arise.

The book is well-produced, free from any notable misprints, and, in spite of its high price, required for anyone interested in this field.

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The Chemistry of the Thiol Group, Parts 1 and 2, Edited by S. Patai (Wiley-Interscience, New York, NY, 1974, 479 and 956 p., respectively, $75.00).

This fifteenth entry in *The Chemistry of the Functional Group* series appears in two separately-bound parts with author and subject indexes appearing at the end of Part 2. The 18 chapters by an international group of 23 authors are organized as other volumes in the series.

General and theoretical aspects are covered in three chapters (160 p.) which include bond energies, ionization potentials, dipole moments, quantum chemistry, structural chemistry of thiols in the solid and gas states and in solution, and thermochemistry. Over 100 pages are devoted to methods for preparing aliphatic and aromatic thiols. This review is critical and emphasizes convenience, yields, by-products, and safety and economic factors of the various synthetic methods.

General chemical methods of qualitative and quantitative analysis of thiols are described in 25 pages. The spectroscopic methods discussed are ultraviolet, infrared, nuclear magnetic resonance, and electron spin resonance (8 p.); mass spectra (25 p.); and optical rotatory dispersion and circular dichroism of chiral thiols (23 p). Two chapters cover hydrogen bonding and acidity of thiols and thio acids and directing and activating effects exerted by the -SH group.

Five chapters deal with reactions of thiols: synthetic uses (62 p.), nucleophilic substitution and addition reactions (64 p.), rearrangements (36 p.), oxidation (56 p.), and protection of the thiol group (16 p.). Photochemistry (26 p.), radiation chemistry (38 p.), biochemistry (80 p.), and synthesis and uses of isotopically labeled thiols (44 p.) are discussed in separate chapters.

All chapters are well written and the printing is clear. Treatment of the subjects is critical and selective as planned by the editor, rather than encyclopedic. Nevertheless, each chapter includes a large number of references, the latest of which are early 1973.

This book is excellent, not only for those involved with sulfur chemistry, but also as a reference source. It is highly recommended for libraries and for individual chemists who can afford the price.

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Industrial Waxes, Vols. I and II, H. Bennett (Chemical Publishing Co., Inc., New York, NY, 1975, 413 and 323 p., respectively, $19.50 ea).

Vol. 1 is divided into two sections, "Natural Waxes" and "Synthetic Waxes." These sections in turn are broken down into discussions of the physical and chemical properties of individual waxes.

Vol. 2 consists of two parts, "Compounded Waxes" and "Wax Technology." The section on compounded waxes involves properties obtained by blends of a variety of different waxes.

The section on wax technology consists of tests, techniques, and industrial uses. This book is nearly the same as the edition published in 1963, although it does contain a few additions and updates.

Due to the wide application of waxes, the book would be useful in nearly all areas of industry. A person using waxes may find the book useful as a reference source. After reading it, he will be able to make an educated decision as to the best type of waxes to use and know who supplies them.

The two volumes contain a wealth of information. In fact, in my opinion, they contain too much information.

Bennett touches briefly on many different aspects of waxes but does not go into any particular area in depth.

Numerous graphs and charts are included which have little or no significance and are not discussed further in the text. Many comments about many waxes are taken directly from service bulletins which are out of date or misleading. The scarcity of footnotes makes it difficult to follow up and obtain more information on briefly covered subjects. Often waxes which are chemically identical but sold under two different trade names are treated as though they were two different waxes. Too much emphasis is placed on trade names of waxes and not chemical structure.

The last 13 pages in Vol. 2 are devoted to test methods of various waxes. This should have been placed near the center of the volume under the section "Test Techniques."

Despite these numerous shortcomings, *Industrial Waxes* is a good reference book. It is the only single reference which attempts to cover the entire spectrum of waxes.

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Polymer Molecular Weights, Vol. 4, Parts I and II, Edited by Philip E. Slade, Jr. (Marcel Dekker, Inc., New York, NY, 1975, 286 and 337 p, $24.50 and $27.50, respectively).

This book is published as a two-part set that comprises Vol. 4 of the series *Techniques and Methods of Polymer Evaluation*. Part I begins with an introduction that explains the concept of the various average molecular weights and introduces the reader to molecular weight distribution. The various chapters are concerned with membrane osmometry, end group determination, absolute colligative property methods, and light scattering. Part II deals with gel permeation chromatography, the viscometric methods for studying molecular weight and molecular weight distribution, and ultracentrifugation sedimentation techniques.

In general, this two-part volume is a useful, needed publication that combines into one comprehensive source information that had been available only in various places. Written by experts in the various methods of molecular weight determination, the books allow one to draw on their backgrounds. Vol. 4 certainly should be useful to the practical chemist, for whom it was intended. However, the various chapters do contain theoretical background information of advantage to those wishing to delve into such considerations. Because the end-use characteristics and properties of polymers depend on molecular weight, the insights and information contained in this work will be useful to most, if not all, people concerned with polymers. In short, it is felt that these books will be well received by the scientific community.

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Process Quality Control: Troubleshooting and Interpretation of Data, Ellis R. Ott (McGraw-Hill Book Co., New York, NY, 1975, 379 p., $14.95).

This book is simply prepared in a physical form which makes the contents easily usable by the reader. The Table of Contents presents headings of subjects that pinpoint areas of statistics and quality control vital in investigations of industrial problems. The Table of Contents is immediately followed by a separate listing of case histories that is quite helpful in the quick location of an appropriate application of statistics.

The chapters and their contents are presented in a logical order that could be achieved only by a person greatly experienced in the field of education. Reading the book, I was assured that the author's experiences in both industrial applications and classroom instructions of statistics had been well integrated in his presentation.

Ott mentions in the Preface a number of well-kown personalities who have written profusely in the field of statistics. I am sure that his contacts with such people as W.A. Shewhart, H.F. Dodge, P.S. Olmstead, and E.B. Ferrell have enriched this text with suggestions and rules for troubleshooting in industrial applications that have not been totally suggested by other authors.

Certainly, any person working in any industrial situation would find the explanations of statistical applications and related case histories useful in solving production problems related to quality or improvement in current production standards. However, any person using this text should have some previous instruction in basic statistics; a simple short preparatory course would be sufficient.

A weakness of this text is that large blank spaces often remain to the right or left of tables or graphs of data (e.g., p. 221). After noting that Table A-12 of the Appendix was not printed on p. 359 of the copy I was reading, I became suspicious of other blank areas and often was uncertain as to whether other omissions had been made. I believe the blank areas on such pages could have been better utilized.

Nonetheless, this text should become a "must" for all colleges and universities in the business of educating process engineers and chemists. It is this broad group of industrial people who will find it most useful.

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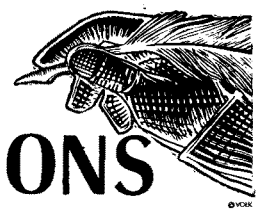
NEW PUBLICATIONS



Index to the 1975 Annual Book of ASTM Standards, American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103, 288 p., $4.00.

Directory of Testing Laboratories, Commercial-Institutional, Special Technical Publication 333D, American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103, 68 p., $3.75.

1975 ASTM Proceedings, American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103, 566 p., $18.00.

1975-1976 List of ASTM Publications, American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103, 30 p., free.

Soap; Engine Coolants; Polishes; Halogenated Organic Solvents; Activated Carbon; Industrial Chemicals, Part 30 of the *1975 Annual Book of ASTM Standards*, American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103, 930 p., $29.00.

Handbook of Materials Science: Vol. III. Nonmetallic Materials and Application, Edited by Charles T. Lynch, CRC Press, Inc., 18901 Cranwood Parkway, Cleveland, OH 44128, 642 p.

Toxic and Hazardous Industrial Chemicals Safety Manual, The International Technical Information Institute, Tokyo, Japan. Available from Media International Promotions, Inc., 114 East 32 St., New York, NY 10016, 580 ., $65.00.