Book Reviews*

Chemical Technicians' Ready Reference Handbook. Second Edition. Edited by Gershon J. Shugar, Ronald A. Shugar, Lawrence Bauman, and Rose Shugar Bauman. McGraw-Hill Book Company, New York. 1981. xxii + 867 pp. $39.50.

This new edition of a very useful book has been extensively revised and almost doubled in size. Simplified explanations as well as numerous diagrams and photographs contribute to its value as a reference book for a wide variety of interests and professions. High-school teachers, college teachers, and workers in chemical industry will appreciate the extent of its coverage, which includes 33 chapters, 4 appendices, and an index. Among the many topics covered are laboratory techniques and procedures, chemicals and preparation of solutions, basic chemistry, electricity, the electromotive series, laboratory first aid, and techniques of glassblowing. Safe handling of chemicals and equipment is emphasized.

M. C. W. Smith

Fundamentals of Multicomponent Distillation. By Charles D. Holland (Texas A&M University). McGraw-Hill Publishers, New York. 1981. xiv + 626 pp. $39.95.

Since the deployment of high-speed computers throughout the chemical processing industry and on university campuses, various investigators have been concerned with the development and use of practical computer models for simulating the behavior of distillation towers. Attempts to reduce appropriate mathematical models to computational practice, however, frequently revealed that the resulting systems of nonlinear equations, and many of the strategies for solving these equations, were not numerically stable and did not comprise a practical approach to simulation. Professor Holland has been a pioneer in the field of distillation modeling for many years and his recent contribution on this subject represents a laudable attempt to reduce a highly complex and abstract subject to a practical, tangible level that will appeal both to the student and the industrial practitioner.

Although this book is written to be used as a text, Professor Holland's insight into distillation techniques and the scope of the book are such that it should also prove to be a useful reference for the expert. Chapter one contains a straightforward review of distillation fundamentals. Chapters 12–15 comprise a lucid description of sieve and valve tray design, the fundamentals of mass-transfer considerations with respect to plate efficiencies and packed columns, multicomponent thermodynamic relationships, and selected topics in matrix operations and numerical methods, respectively.

Since much of this information can be found in other references, the real justification for buying this book lies within the intermediate chapters where Holland compares and contrasts his theta method, the 2*N* Newton–Raphson method, and the Almost Band Algorithms of the Newton–Raphson method with respect to their convergence properties for simple distillation towers, systems of interconnected distillation towers, complex towers with sidestreams and pumparounds, and azeotropic and extractive distillation towers. Chapter 7 considers the impacts of energy integration on the numerical stability of the equations to be solved and suggests practical guidelines for enhancing the network convergence properties. Chapter 8 discusses the ramifications of distillation with chemical reaction, and the design engineer will find useful modeling suggestions in Chapter 9 where Holland addresses economic optimality and suggests useful approximations and criteria for model improvements. Chapter 10 describes the characteristics of continuous distillation towers at several modes of operation. In Chapter 11, Professor Holland discusses the implications of minimum reflux with respect to both simple and complex distillation tower configurations.

Both chemists and chemical engineers will appreciate Professor Holland's straightforward treatment of this subject, and the book contains many detailed examples and illustrations that substantially enhance its pedagogical value. This book can be appropriately integrated into a senior chemical engineering design sequence if the students have been introduced to the fundamentals of binary distillation and numerical methods in previous courses. The depth of analysis, however, should also prove challenging and useful to graduate chemical engineers. In addition, the industrial expert will find this book to be a useful reference that contains many practical suggestions for improving computer models and the mathematical descriptions of countercurrent flow systems.

D. William Tedder, *School of Chemical Engineering, Georgia Institute of Technology*

* Unsigned book reviews are by the Book Review Editor.

Polymer-Supported Reactions in Organic Synthesis. Edited by P. Hodge (University of Lancaster) and D. C. Sherrington (University of Strathclyde). John Wiley & Sons, New York. 1980. xiv + 484 pp. $88.00.

The editors' primary intent in organizing this book was to present in one volume recent important synthetic applications of chemically active species bound to polymer supports. Secondarily, they hoped to "close the gap between classical organic and classical polymer chemistry". They have clearly succeeded in meeting the former goal. Whether the latter is met will depend entirely upon the audience the book is able to attract.

The concept of using insoluble, functionalized polymers as catalysts or reagents is not a new one. Ion-exchange resins and the Merrifield peptide synthesis are two well-known examples. Recently, however, the number of applications involving polymer-supported reagents in organic synthesis has increased dramatically. Some of these reagents are now commercially available. Thus this book is particularly timely.

The book is divided into ten chapters, each written by an expert in the area covered. A brief introduction entitled "Why study polymer-supported reactions?" is followed by a chapter which discusses basic principles of polymer chemistry and the preparation of functionalized polymeric supports. The authors are to be commended for summarizing such a large body of knowledge into a lucid, succinct, and highly readable 80 pages. Organic chemists with only a passing interest in polymeric reagents are encouraged to read these sections.

The next eight chapters are divided among the major areas of polymer-supported reagents, catalysis (ion-exchange, enzyme-like, and polymer-bound transition metal), polymer-supported protecting groups, and synthesis of biologically important molecules utilizing polymer supports. Miscellaneous topics are collected in the last chapter.

Throughout, discussion focuses on the important features of a given type of reaction, providing sufficient detail to allow the reader to compare the merits of a polymer-supported technique with more conventional approaches. Examples are plentiful. Ample references permit those interested rapid entry into the primary literature. The overall result is a depth of coverage that is considerably greater than that in Mathur, Narang, and Williams' recent addition to the field,[1] which places a greater emphasis on biochemical applications.

Until recently, most accounts of the syntheses and uses of new polymeric reagents have appeared in periodicals read predominately by polymer scientists. It is no secret that many organic chemists view polymers as complicated, enigmatic materials best studied by macromolecular specialists. This book is an attempt to make available concepts of potentially great use to organic chemists who would in all probability not otherwise encounter them. Chemists in a variety of disciplines would find these techniques useful. Unfortunately the exorbitant price will discourage most individuals from acquiring the book. However, all libraries with holdings in organic chemistry should add this book to their collection.

David M. Teegarden, *Xerox Webster Research Center*

(1) Mathur, N. K.; Narang, C. K.; Williams, R. E. "Polymers as Aids in Organic Chemistry"; Academic Press: New York, 1980.

Spectres d'Absorption ultraviolets de Composés organiques Azotés et Corrélations spectrochimiques. Volume 3. Composés Carbonylés et dérivés ajoutés. By P. Grammaticakis. Technique et Documentation, 75008 Paris. 1980. 106 pp. 150 francs.

In this paper-bound volume, the author continues his Atlas of electronic spectra, together with his own special method of interpreting them (see the following review: *J. Am. Chem. Soc.*, **102**, 7161 (1980)). Hydrazones of all types, including semicarbazones, sulfonylhydrazones, and azines, form the bulk of the material presented, but oximes, nitrones, and anils are also included. The spectra are presented only graphically, and the scale is generally not large, so that it is difficult to determine precise numerical values for λ_{max} from them. The spectra occupy about half of the book; the second half is devoted to a discussion of correlations and to a compound index.