

## Book Reviews\*

**INTERFACIAL PHENOMENA: Equilibrium and Dynamic Effects (Surfactant Science Series, Volume 17).** By Clarence A. Miller and P. Neogi. Marcel Dekker: New York. 1985. 376 pp. \$69.50 (U.S. and Canada); \$83.25 (all other countries). ISBN 0-8247-7490-6.

This book covers both equilibrium and dynamic properties of interfaces in a series of chapters: Fundamentals of Interfacial Tension, Fundamentals of Wetting and Contact Angles, Colloidal Dispersions, Surfactants, Interfaces in Motion—Stability and Wave Motion, Transport Effects On Interfacial Phenomena, and Dynamic Interfaces.

The first four chapters are very well written, but with necessity are rather short, and should be viewed as a good and useful introduction to the last three chapters rather than specific treatises per se. The chapter on colloidal dispersions follows the usual trend in descriptions of this kind by first introducing the forces between colloidal particles, followed by an analysis of the kinetics of flocculation. The opposite order usually facilitates the grasp of this subject by beginners in the field, but it is not often encountered.

These chapters, although well prepared, are not the strength of the book; its value lies with the fact that this traditional surface and colloidal chemistry treatment is combined with three excellent chapters on the dynamic phenomena at interfaces. Chapter 5 describes the motion of an interface, its damping or growth in cylinders, and thin films.

Chapter 6 is devoted to mass and heat transfer and its influence on the motion and stability of an interface while the final chapter is a very useful treatment of interfaces under flow conditions such as in dip coating.

This book is a very valuable addition to practitioners in the field and is strongly recommended for advanced undergraduate and graduate students.

Stig E. Friberg, *University of Missouri—Rolla*

**The Chemistry and Biology of Isoquinoline Alkaloids.** By J. D. Phillipson and M. F. Roberts (School of Pharmacy) and M. H. Zenk (Universität München). Springer-Verlag: New York. 1985. viii + 304 pp. \$39.00. ISBN 0-387-13980-X.

This book is multi-authored, with each chapter based on a lecture given at a 1984 symposium. As a result, it lacks some cohesiveness as such volumes tend to do, although the authors have usually managed to make chapters a general and historical exposition of the topic rather than a detailed description of personal research. All chapters are well referenced, most containing references to 1983 or 1984 and some even to 1985. The authors have aimed the book (as was the symposium) at scientists of different backgrounds, from botanists to chemists to pharmacologists; and the contents reflects this variety of interests. Four of the chapters, including an introductory one on plants as a source of isoquinoline alkaloids, focus on the description of various groups, the simple isoquinolines, the bisbenzylisoquinolines, and the Erythrina and Annonaceae alkaloids. Another four chapters describe the relationship of structure to activity and to pharmacological effects and consider the Opium, Cularine, Aporphin, and Morphinan alkaloids. Three chapters cover various aspects of the biosynthesis of isoquinoline alkaloids. In addition there are chapters on the chemotaxonomy of the Papaveraceae, the synthesis of morphine-type and monoterpene-type isoquinolines, alkaloid production by plant cell cultures, and cytodifferentiation. Given such a varied coverage of the subject, it is to be expected that there will be areas ignored. For example, there is no significant mention of the C<sub>6</sub>-C<sub>2</sub> + C<sub>6</sub>-C<sub>1</sub> group found in the Orchidaceae or Amaryllidaceae (e.g., lycorine). While this is not a comprehensive treatise on isoquinoline alkaloids, it does view the group widely from a variety of aspects and offers insights from various areas of scientific interest. It is therefore a useful addition to the literature and should be attractive to a variety of users especially since it has a moderate price tag.

J. R. Gear, *University of Regina*

**Methods in Enzymology, Volume 124. Hormone Action. Part J: Neuroendocrine Peptides.** Edited by Michael Conn (University of Iowa College of Medicine). Academic Press, Inc.: Orlando, FL. 1986. XXVIII + 679 pp. \$77.50. ISBN 0-12-182024-6.

Major advances in the field of neural/neuroendocrine peptides are critically dependent upon the development and utilization of appropriate culture, autoradiographic, and miniaturized chemical techniques in order to understand the structural and functional roles of these molecules

because of the number of functionally different cell types intermixed in nervous tissue. This volume includes a variety of techniques valuable for designing structural analogues, localizing the sites of synthesis, and the types of posttranslational processing and secretion, as well determining receptor mechanisms and localization. The methods have general applicability to the study of many neuropeptides and their target cells; their use in a number of systems may well be expected to produce valuable insights into neural and endocrine function.

The volume is divided into five sections: I, Preparation of Chemical Probes; II, Equipment and Technology; III, Preparation and Maintenance of Biological Materials; IV, Quantitation of Neuroendocrine Substances; and V, Localization of Neuroendocrine Substances. The volume extends the variety of techniques and strategies which have been described in previous volumes of this series. While no single book can be all-inclusive with respect to the variety of such methods, there is a good distribution of techniques ranging from computer design of analogues to the isolation and maintenance of single cells in culture. Several areas are of particular interest: for instance, computer-directed biorational design of peptides; detergent design and synthesis for the solubilization of membrane-bound receptors; culture systems for a variety of cell types; and molecular biology methodology such as hybridization techniques to localize mRNA, gene transfer methods, and the use of vaccinia as an expression vector for cloning. Two chapters deal with measurement of the growth hormone releasing factor. Four deal with in situ hybridization and several with autoradiography of receptors. The discussion of the reverse hemolytic plaque assay illustrates the use of complement fixation and hemolysis in cell culture to identify and quantitate secretory products of single cells in culture. Methods for analysis of phosphatidyl inositol metabolites and quantitation of intracellular calcium provide useful insight into receptor mechanisms common to transmitter function, growth and differentiation, and cellular transformation.

For the most part, the material presented should be valuable to all neuroscientists and, in particular, neurochemistry students. The volume continues the excellent presentations for which this series is well-recognized.

Ruth S. Gurd, *Indiana University School of Medicine*

**Advances in Chemistry Series, Number 211. Multicomponent Polymer Materials.** Edited by D. R. Paul (University of Texas—Austin) and L. H. Sperling (Lehigh University). American Chemical Society: Washington, DC. 1986. xii + 354 pp. \$79.95. ISBN 0-8412-0899-9.

In an earlier era of polymer chemistry, new engineering polymers with useful properties could be discovered by polymerizing novel or untried monomers. With the maturation of polymer chemistry, the discovery of homopolymers with new and useful properties is increasingly infrequent. One of the ways in which new polymeric materials with tailored properties can be prepared is by blending two or more components. The history and current status of polymer blend research are covered very well in this volume, which was drawn from a symposium held in August of 1984.

The volume opens with reviews of phase behavior in polymer blends and recent developments in interpenetrating polymer networks (IPNs). These reviews provide a good introduction to the chapters which follow. The classes of polymer blends discussed in this volume include IPNs, simultaneous interpenetrating networks (SINS), random and block copolymers, miscible blends, and rubber-modified epoxides. There are sections dealing with polymer characterization and mechanical properties, respectively.

In summary, this volume is a useful introduction to multicomponent polymers and is a good addition to one's polymer sciences library.

James F. Haw, *Texas A&M University*

**The Alkaloids. Chemistry and Pharmacology. Volume XXV. Antitumor Alkaloids.** By Matthew Suffness (National Cancer Institute) and Geoffrey A. Cordell (University of Illinois at Chicago). Series editor: Arnold Brosi. Academic Press, Inc.: Orlando, FL, and London. 1985. xviii + 369 pp. \$72.50. ISBN 0-12-469525-6.

The continuing value of the series, *The Alkaloids*, can never be overestimated. Without the review articles and comprehensive literature references, the prospect of searching the journals for structural types as diverse as alkaloids would be a daunting task indeed. This volume collects together, under the expert authorship of Suffness and Cordell, a large range of structurally diverse compounds with notable antitumor activity. The types covered are Erythrophleum, taxas, Sesbanca, Pyr-

\*Unsigned book reviews are by the Book Review Editor

rolizidine, Acronycine, Emetine, Cephalotaxus, Colchicine, Camptothecin, Ellipticine, Maytansinoids, Phenanthroindolizidine, Quinolizidine, Bisisoquinoline, Benzo[c]phenanthridine, Protoberberine, Amaryllidaceae, and so called miscellaneous alkaloids, a formidable list. The bisindole alkaloids, and in particular vinblastine and vincristine, were reviewed in Volume XX (1981). Each chapter describes the synthetic endeavors, antitumor activity, mechanism of action, clinical studies, and any other pertinent biological information.

This volume continues to maintain the highest of standards, which has come to be the hallmark of this series. I cannot imagine anybody, contemplating doing research in the area of alkaloid chemistry, who would not consult these volumes. Fortunately, the price is reasonable enough to allow individual ownership.

Philip D. Magnus, *Indiana University—Bloomington*

**Electron Spin Resonance. Volume 10A.** Senior Reporter: M. C. R. Symons. The Royal Society of Chemistry: London. 1986. vii + 199 pp. \$107.00. ISBN 0305-9578.

This continues the series of specialists reports published by the Royal Society of Chemistry. My laboratory has found these volumes on electron-spin resonance to be extremely useful, and we have purchased them all. This volume is as useful as the preceding volumes. In particular, I found the 22-page review on free radical in biology to be particularly useful, and I found it to be quite complete and reasonably well organized.

This present volume includes chapters on free radicals in solution (by B. J. Tabner), organic radicals in solids (by T. J. Kemp), triplets and biradicals (by A. Hudson), ESR in polymer chemistry (by D. J. T. Hill, J. H. O'Donnell, and P. J. Pomery), spin labels in biological systems (by C.-S. Lai), free-radical studies in biology and medicine (by N. J. F. Dodd), and an 8-page summary of their recent developments in loop-gap resonators by the Milwaukee group (by J. S. Hyde and W. Francisz).

These volumes have an author index but no subject index, and I find that to be a severe limitation in their use. It would not seem to be too difficult to prepare a subject index, and it would make these books far more useful to the reader. For example, in the chapter on free-radical biology, related work on cigarette-smoke chemistry is summarized on pp 149 and 157, which a page-by-page reader would pick up; however, a person using this book as a casual reference might not pick up those two citations to the same literature, which are widely separated in pages, without a subject index.

William A. Pryor, *Louisiana State University*

**Chemistry of Pseudohalides.** By A. M. Golub and V. V. Kohler (both of Ševčenko University, Kiev) and H. Köhler (Martin Luther University, Halle-Wittenberg). Elsevier Science Publishers: Amsterdam and New York. 1986. 479 pp. \$109.25. ISBN 0-444-99534-X.

This is a translation of a German original published in 1979, which has been updated to 1980. The subject is a group of anions and their derivatives, consisting of azides, cyanides, cyanates, fulminates, thiocyanates, selenocyanates, tricyanomethides, and dicyanamides. The authors do not clearly define what constitutes a pseudohalide, but they list a group of rather unsatisfying characteristics, such as "By analogy with the hydrogen halides, there exist hydrogen pseudohalides which form acids of varying acidities in aqueous solutions." In a table, they list the following structural types:  $AB^-$ ;  $ABC^-$ ;  $A(BC)_2^-$ ;  $A(BC)_3^-$ ;  $A(BC)_n^-$ . Each example is given a chapter, in which structural and reactivity information is presented and the many individual compounds (salts and complexes) are described. The content is thus largely descriptive.

The greatest strength of this work lies in the large number of references that it organizes; over 500 per chapter is not uncommon. Even so, some important points have been overlooked; for example, nothing is said about the basicity of  $HN_3$  and the formation of  $H_2N_3^+$  and  $H_2N_3^{2+}$ . It is a pity that more attention was not given to the index, which is inadequate for the quantity of information in the text; too many page citations are given under index entries that are too broad, such as "Titanium pseudohalides", followed by twelve pages of citations, or "X-ray structural data of pseudohalide derivatives" followed by 14 citations. Nevertheless, the book is a valuable key to the not-too-recent literature.

**Organosilicon Chemistry.** By S. Pawlenko (Kamen, West Germany). Walter de Gruyter: Berlin and New York. 1986. xi + 186 pp. DM 190.00. ISBN 3-11-010329-X.

As the author states, there are about 100 000 publications on organosilicon chemistry. A comprehensive monograph covering all aspects of the field could be a useful reference source. With a large and diverse area to cover, condensing the topic into a short yet comprehensive monograph is difficult. Often the choice for the specific inclusion of a subject is a matter of personal opinion. On the whole, the author has covered the many and varied aspects of organosilicon chemistry at least to a small extent.

It is unclear who the intended audience for this monograph is. The author claims that it is intended primarily for industrial and academic chemists—presumably with little background in organosilicon chemistry. The approach is often naive and contains too many errors. For example, on page 22, the reduction of a silylacetylene to a vinylsilane is described as stereospecific although it produces a mixture of *E* and *Z* isomers.

Diagrams of the apparatus used for the preparation of some organosilicon compounds have been included together with some experimental details. As with the book in general, the depth of coverage varies greatly. In some cases a topic can be treated in a cursory manner while others are discussed in detail. Compounds are named in full for reference, which can make reading and cross-referencing to diagrams and equations difficult.

Although the bibliography is comprehensive and includes all of the major works and reviews in the field, the references are frustrating to a worker outside of organosilicon chemistry. Only publications prior to early 1985 have been included. Often just the first paper for a reaction or procedure is referenced which makes follow-up papers difficult to find. The book contains a relatively large number of typographical errors and, unfortunately, this is carried over into the reference section.

The index is extremely difficult to use as it connects compound type, such as silanol, with empirical formula and compound name without reference to reaction types and general synthetic procedures. The table of contents proved more useful than the index to find a specific transformation.

This monograph covers every aspect of organosilicon chemistry, but to various degrees. As a general introduction to the whole field it could prove useful, but one of the works cited in the bibliography would prove more productive to someone with a problem to solve. Certainly, the application, scope, and limitations of many reactions are not discussed in detail. The index detracts greatly from the use of this book as a primary reference work.

David J. Ager, *NutraSweet Research and Development*

**Molecular Beams.** By Norman F. Ramsey (Harvard University). Oxford University Press: New York, NY. 1985. xii + 466 pp. \$28.95. ISBN 0-19-852021-2.

At first, one might imagine that a volume entitled *Molecular Beams* would be particularly timely, given the recent Nobel Prize in Chemistry. However, this edition is a paperback version of Ramsey's original book, first published in 1956. It has not been updated since. This fact becomes clear by noting that the index does not list D. Herschbach, Y. T. Lee, or J. Polanyi. Indeed, this book precedes the development of supersonic molecular beams. (In this regard, it is interesting to find that Ramsey recommends low source pressures in order to avoid excessive scattering of the molecules in the source channel.)

This book does appear to be a timeless and rather complete theoretical and experimental treatment of electric and magnetic resonance molecular-beam experiments for studying the radio frequency spectra of atoms and molecules. The theory of interactions of the nucleus with atomic and molecular fields is extensively presented. Measurements of atomic and nuclear magnetic moments, electric multipole moments, and atomic fine and hyperfine structure are detailed. Useful but somewhat outdated chapters on gas kinetics, molecular beam design, and experimental techniques are also included.

Peter B. Armentrout, *University of California*

**Introduction to Computer-Assisted Experimentation.** By K. L. Ratzlaff (University of Kansas). John Wiley & Sons: New York, NY. 1987. xv + 438 pp. \$44.95. ISBN 0471-86525-7.

The emphasis of this book is on interfacing of experiments to small computers. Included are separate chapters on digital and analog electronics, two chapters on transducers, and chapters on interfacing, graphics, data communication, and laboratory computational techniques. The chapters are full of sound general advice and specific problems related to different approaches. There is good balance between data collection and experiment control. Software and hardware are both covered in depth, but the strength of the book is in the area of hardware. Many useful diagrams and tables are included. A visible shortcoming for many will be the lack of abundant references and suggested additional readings.

Chemists using interfaced apparatus and those undertaking or considering experiments using a computer-interfaced apparatus will find this book useful. The book could also be used as a text for a graduate of advanced undergraduate course in computer interfacing if you complimented it with separate laboratory instructions. Computer jargon is avoided where possible and the book requires only an understanding of general physics. The reader is rewarded with an understanding of benefits and pitfalls in computer-assisted experimentation.

James W. Beatty, *Ripon College*