Additions and Corrections

Catalytic Directed Steroid Chlorination with Billiofold Turnovers [*J. Am. Chem. Soc.* **1986**, *108*, 2485]. RONALD BRESLOW* and MONICA P. MEHTA

Thioxanthones as High Turnover Catalytic Templates in Directed Chlorination Reactions [*J. Am. Chem. Soc.* **1986**, *108*, 6417–6418]. RONALD BRESLOW* and MONICA P. MEHTA

A Novel Bifunctional Chlorination Mechanism in Template Catalyzed Directed Functionalization with High Effective Molarities and Rates Approaching Diffusion Control [*J. Am. Chem. Soc.* **1986**, *108*, 6418–6420]. RONALD BRESLOW* and MONICA P. MEHTA

Several findings reported in these papers cannot be reconfirmed, including some that affect the principal conclusions. Accordingly, these papers are retracted.

Book Reviews*

Solubility Data Series. Volume 19: Cumulative Index for Volumes 1–18. Edited by Colin L. Young. Pergamon Press, New York. 1985. x + 300 pp. $100.00. ISBN 0-08-032495-9.

Solubility Data Series. Volume 20: Halogenated Benzenes, Toluenes, and Phenols with Water. Edited by Ari L. Horvath and Forrest W. Getzen. Pergamon Press: New York. 1985. xxiv + 266 pp. $100.00. ISBN 0-08-023926-9.

Solubility Data Series. Volume 24: Propane, Butane, and 2-Methylpropane. Edited by Walter Hayduk. Pergamon Press: New York. 1986. xxii + 447 pp. $100.00. ISBN 0-08-029202-X.

The cumulative index to the first 18 volumes of this monumental work will greatly increase the ease of use of the book. It consists of three parts: System Index (compounds by name), Registry Number Index, and Author Index. The compounds are listed in alphabetical order, but it is a pity that IUPAC names are not used instead of the circumlocutions that appear in Chemical Abstracts; i.e., instead of "aluminium nitrate", one finds "nitric acid, aluminium salt". However, there are cross references so one can eventually find the listing.

The other volumes continue the painstaking sifting of the reported data, giving critically examined best values with supporting information, such as estimated errors, purity of materials, method of measurement, etc. There is nothing else that approaches the thoroughness of this work.

Organometallic Compounds in the Environment; Principles and Reactions. Edited by P. J. Craig (Leicester Polytechnic). John Wiley & Sons: New York. 1986. xxii + 368 pp. $75.00. ISBN 0471-84727-5

The editor defines an organometallic compound as one possessing a direct metal-to-carbon bond. Thus compounds in which the metal is bonded only by oxygen, nitrogen, or sulfur ligands are not discussed.

A number of the chapters are authored by persons actively working in this area of environmental chemistry. Four chapters are authored by the editor. The approach is to discuss general considerations of the occurrence and pathways of organometallic compounds in the environment (Chapter 1), followed by individual chapters for organomercury, organotin, organolead, organoarsenic, and organosilicon compounds (Chapters 2–6). Chapter 7 discusses the group VI elements, Chapter 8 gives a good overview of methyl-transfer reactions for the above mentioned compounds as well as Pt, Au, Cr, Pd, and Tl compounds. Organometallic compounds in polymers are treated in Chapter 9, and the book concludes with a discussion of other organometallic compounds in the environment, e.g., Sb, Ge, Tl, Co, P, Mn, and Cd.

The chapters are well written and very informative. The editor claims this "volume constitutes the only recent single-volume source of information in this area." I agree with the statement. A goodly account of the toxicity of these types of compounds is well presented.

This book should be in every environmental laboratory library and many active workers in this area of toxic metals should think about purchasing the book. The book does suffer from one of the drawbacks of an edited book, that of the omission of recent references (back 1 year, minimum). This is a negative aspect of all such publications because it may take anywhere from six months to a year between the time the editor receives all the final manuscripts and the time the book is actually published. This, however, does not detract from the usefulness of this book.

Robert L. Grob, *Villanova University*

Catalysis Science and Technology. Volume 6. Edited by John R. Anderson and Michel Boudart. Springer-Verlag: New York. 1984. x + 312 pp. $49.00. ISBN 3-540-12815-8.

The volume of research literature on catalysis and surface science has increased enormously during the last decade, and it has become impossible for any one investigator to follow all the new developments. This series on catalysis science and technology attempts to correct the problem to some extent by presenting review articles that are more than just a listing of the current literature. The topics are based on important established material, and sufficient scientific and technological background information is provided to make the series a valuable source of reference.

Volume 6 has four chapters. Chapter one is by J. B. Butt and is on the often neglected but very important area of catalyst deactivation and regeneration. The chapter starts with the fundamental chemistry side, focused on the mechanisms of poisoning and coking. Major emphasis is on the engineering side of deactivation and regeneration. Related areas of transport phenomena and reactor analysis are discussed in detail. At each step the reader is given enough information to understand the topic and prepared for the following discussion. Perhaps a little bit more detail in some of the derivations would certainly have made reading much more easier. In general this chapter is systematic enough to be used as a text in a graduate course.

Chapter 2 is on Catalytic Olefin Polymerization reactions by I. Pasquon and U. Giannini. The major fault of this chapter is that it is easy enough to follow for an experienced reader, but the flow is interrupted too many times, by the enormous number of references, for the general reader to make any sense out of what is being discussed. Some of the references are controversial but not enough information is given for each reader to reach his own conclusions. If the authors had taken a stand on the controversial issues and presented their own views to the readers, this review would have been much better. Another shortcoming of this chapter is the lack of any discussion on the kinetics and modeling of

*Unsigned book reviews are by the Book Review Editor.

polymerization reactions.

Chapter 3 is on Metal Catalyzed Skeletal Reactions of Hydrocarbons on Metal Catalysts by G. L. C. Maire and F. G. Garin. this also is a very organized review and there are no discontinuities in subject matter. The authors have done an outstanding job of analyzing the variety of mechanisms proposed by different groups and taking their own stand on each issue. The only minor flaw is in the somewhat sparsely documented discussion on electronic vs. geometric factors on the catalyst surfaces.

Chapter 4 is on Dispersed Metal Catalysts by K. Foger. This is an outstanding article giving the unfamiliar reader a good background on the subject matter. Advantages and disadvantages of the various prepartion and characterization methods are presented to the reader in a clear and easy to understand style. Structure of supports as well as small metal crystallites are discussed in detail. This chapter, too, is of the textbook quality.

In the summary, this volume is a very valuable addition to the catalysis literature. It will be of particular use as a reference for the beginning scientists and graduate students.

E. Gulari, *University of Michigan*

Partitioning in Aqueous Two-Phase Systems: Theory, Methods, Uses, and Applications to Biotechnology. Edited by Harry Walter (University of California, Irvine), Donald E. Brooks (University of British Columbia), and Derek Fisher (University of London). Academic Press, Inc.: New York. 1985. xxiv + 704 pp. $65.00. ISBN 0-12-733861-6.

This book is an excellent, up-to-date review of aqueous two-phase partitioning and its application to the purification, characterization, and study of various biomaterials. The book is divided into 17 chapters, all written by scientists actively involved in applying this technique in their present research projects. Each chapter is devoted to a discussion of either the theoretical basis for partitioning, specific applications, or laboratory, preparative, or analytical techniques applicable to the use of aqueous two-phase systems. The specific applications covered are protein, nucleic acid, cell, and organelle partitioning, measurement of blood cell surface properties, and the use of aqueous two-phase partitioning to study various biomolecular interactions. The authors present both general behavior and specific examples in sufficient detail to give the reader enough information to perform an initial experimental design. General technical aspects of aqueous two-phase partitioning are covered in chapters dealing with countercurrent distribution, affinity partitioning, and preparative scale protein purification.

One chapter that, I feel, is especially useful is entitled Preparation of Phase Systems and Measurement of their Physicochemical Properties. This chapter contains information on how to do an initial phase-system design as well as a detailed discussion of the various analytical techniques used to analyze the numerous components and properties of these systems. In addition to the reference lists at the end of each chapter, the editors had the good sense to devote one whole chapter to a list of over 750 publications dealing with various aspects of aqueous two-phase partitioning. This alone is probably worth the price of the book. Any researcher presently interested in the purification, characterization, or study of biomaterials should find this book a useful addition to their library.

Geoffrey F. Slaff, *National Bureau of Standards*

Protein Secretion: A Critical Analysis of the Vesicle Model. By Stephen S. Rothman (University of California—San Francisco). John Wiley and Sons: New York. 1985. x + 347 pp. $85.00. ISBN 0-471-87976-6.

This book is of a rather unusual type in the literature of a hard science. Instead of being a pedagogical vehicle, or a repository of information, the book is basically a polemic aimed at undermining the generally accepted vesicle model of protein transport and championing Rothman's own diffusive model—one in which proteins are transported across membranes by simple diffusion.

The author realizes he has his work cut out for him. He begins his attack with an epistemological discussion to remind the reader of the limits of experimental knowledge and of the contribution of assumptions to the formation of intellectual models. Ordinarily, this would not seem to be an important thing to do, but Rothman realizes that the vesicle model is so well established in current experimental science and in modern textbooks that he must first convince us that it could *possibly* be wrong. This lesson is valuable in itself, because we do need to be reminded that generally accepted theories or models may be wrong and that in fine details most are certainly wrong. It also pays to be reminded that there are those whose correct vision has not been immediately recognized, and who have been victimized in a sense by the larger scientific community.

In building his case, Rothman writes well, has chosen and organized his arguments carefully, and presents them clearly. On the other hand, the book seems very defensive and occasionally petty, and it seems to have ignored or tried to trivialize the staggering biochemical evidence in support of the vesicle model.

Rothman is a physiologist and tries to convince us that his point of view is a holistic one superior to the reductionist view of biochemistry and molecular biology. It is, of course, true that an organism is more than the sum of its parts, but in our analysis we cannot neglect the existence of those parts. For example, he makes no real mention of the fact that most transported proteins are glycosylated and that these biochemical markers seem to determine the transport routes within and out of the cell. Their role in the "diffusive model" is unclear.

Rothman also takes issue with the signal hypothesis of protein synthesis and membrane transport; he dislikes the "complication" of the system and its vectorial nature. That the machinery for the process is being chemically characterized and must surely exist for some reason seems to escape him. Also, the vectorial nature of the process would seem consistent with the general philosophy of cellular metabolism, by which important reactions and processes are irreversible. Cleavage of the signal peptide accomplishes this control in the important membrane transport process.

In his conclusion, Rothman admits he cannot disprove the vesicle model of transport, nor can he unequivocally prove his own model of membrane transport by diffusion. He hopes for a fair hearing of his views and a consideration that it may explain at least some if not all the experimental data. My own feeling is that the vesicle model will hold its own, at least until a more compelling challenge than this one comes along.

Jon D. Robertus, *University of Texas*

Polymer Science and Technology. Volume 33. Renewable-Resource Materials. New Polymer Sources. Edited by Charles E. Carraher, Jr. (Florida Atlantic University) and L. H. Sperling (Lehigh University). Plenum Press: New York and London. 1986. ix + 332 pp. $59.50. ISBN 0-306-42271-9.

Everyone from every country should be concerned with the improved utilization of the earth's natural resources. This book is concerned with the making of new and improved polymers from renewable resources. While the current low price of oil has discouraged interest in polymers from renewable resources, the long term shortage of oil is a reality and natural product research should be developed systematically and with continued support.

A surprising number of twentieth-century polymers have their origins in natural products. Among these are nylon, alkyd paints, and rayon. A possible commerical use of spider web silk is proposed. Included in the section on saccharides and polysaccharides are chapters on neutral vegetable fibers, polysaccharides from lichens, and newer applications of bagasse. Several chapters on the use of grafted wood fibers and chemical modification of wood are included in the section on graft polysaccharides. The last three sections are devoted to oils, proteins and leather, and rubber, lignin, and tannin. References and an index are included.

This book will be of interest to natural products chemists as well as anyone concerned with economic development in third-world countries.

M. C. W. Smith, *Ann Arbor, Michigan*