Additions and Corrections

Mechanism for the Catalytic Activation of Ecteinascidin 743 and Its Subsequent Alkylation of Guanine N2 [*J. Am. Chem. Soc.* **1998**, *120*, 2490−2491]. Bob M. Moore, II, Frederick C. Seaman, Richard T. Wheelhouse, and Laurence H. Hurley*

Three of the structures in Chart 1 were mislabeled in the text: structure **2** is saframycin S, structure **3** is naphthyridinomycin, and structure **4** is anthramycin.

JA9855186

S0002-7863(9)-05518-8
Published on Web 09/11/1998

Novel Spiro Phosphinite Ligands and Their Application in Homogeneous Catalytic Hydrogenation Reactions [*J. Am. Chem. Soc.* **1997**, *119*, 9570−9571]. Albert S. C. Chan,* Wenhao Hu, Cheng-Chao Pai, Chak-Po Lau, Yaozhong Jiang,* Aiqiao Mi, Ming Yan, Jian Sun, Rongliang Lou, and Jingen Deng

Page 9570: in the introduction section (first paragraph) we inadvertently missed citing a paper published by RajanBabu *et al.* (RajanBabu, T. V.; Ayers, T. A.; Casanuovo, A. L. *J. Am. Chem. Soc.* **1994**, *116*, 4101). Through different designs of phosphinite ligands from the same sugar backbone, the authors were able to get both L- and D-isomers of Rh-catalyzed hydrogenation products in good to excellent ee.

JA985517D

S0002-7863(98)05517-6
Published on Web 09/15/1998

Book Reviews

Surface Diffusion: Atomistic and Collective Processes. NATO ASI Series B: Physics. Volume 360. Edited by M. C. Tringides (Iowa State University). Plenum: New York and London. 1997. xi + 724 pp. $175.00. ISBN 0-306-45613-3.

Surface diffusion is of practical and fundamental importance to various areas of science and technology. Understanding the nature and consequences of the dynamic behavior of atoms and molecules on surfaces is a major objective of many condensed matter physicists, physical chemists, and materials technologists. This book, a collection of lectures and seminars given at a NATO Advanced Study Institute meeting held in Greece in 1996, presents a relatively well-rounded picture of the most recent approaches to the problem of surface diffusion.

The volume starts out after a preface summarizing the general aims and overall significance of the proceedings, which is then followed by an introduction written also by the editor. This introduction contains the fundamentals of the subject and a brief overview of the contents of the book, including a summary list of the different experimental methods used in recent investigations. Newcomers to the field will certainly benefit from the orientation, although they may not be satisfied with the single reference given. The rest of the book consists of 66 chapters grouped into seven categories. Except for one, each category contains 6−10 chapters. Part 1 deals with single-atom diffusion, both theoretically and experimentally. Part 2, Surface Diffusion and Epitaxy, has 23 contributions addressing such topics as nucleation, growth, and effects of surfactants. The third part focuses on large clusters, while part 4 covers measurements of collective diffusion and surface diffusion in connection with phase transitions. The fifth part discusses the effects of substrate, and part 6 deals with diffusion far from equilibrium. Finally, part 7 examines other atomistic processes related to diffusion. The book ends with an index of contributors and a subject index.

A lot of topics covered in this volume are of interest in current research. In particular, the state-of-the-art measurement techniques and computation methods developed are remarkable. A primary aim of the book is to obtain a more unified view and a better understanding of the problem, and this has certainly been achieved. The nearly 2000 citations, of which most (about 60%) are from the 1990s, are definitely a strong point of this volume. It is obvious that the field has been the focus of intensive research efforts and has now reached a state of maturity. One drawback of the book, however, is that more emphasis is placed on the physicists' perspective, even though the research area is generally regarded as being at the crossroads of chemistry and physics. Chemists should find it readable, nonetheless.

Overall, this is a very useful book for anyone who wants to familiarize themselves with the various aspects of the field and for those looking for new perspectives to enlarge their expertise. It is therefore recommended for research libraries as well as personal collections.

T. C. Chan, *The Hong Kong Polytechnic University*

JA985638D

S0002-7863(98)05638-8

A Practical Guide to Graphite Furnace Atomic Absorption Spectrometry. By David J. Butcher and Joseph Sneddon. Wiley: New York. 1998. $69.95. 250 pp. ISBN 0-471-12553-9.

This book is volume 149 of the monograph series Chemical Analysis edited by J. D. Winefordner, and provides an up-to-date coverage of the essentials in graphite furnace atomic absorption spectrometry

(GFAAS). The authors are active researchers in the area, have written the book in tutorial fashion, offer their insight into using the technique successfully, and manage to present only important materials in a mere 250 pages. The chapters are very concise and assisted with numerous tables and figures for easy reference.

There are nine chapters and four appendices. Each chapter is self-contained, is supported with references (up to 1996), and may be consulted independently. Chapter 1 is less than two pages, introduces GFAAS, and outlines instrumentation and protocols for achieving accurate results. A table lists later chapters in reference to the pertinent discussions. Chapter 2 briefly covers the basic theory of atomic spectroscopy, the reactions between analytes and the furnace environment, and the shape of the analyte signal. Chapter 3 concerns calibration. The essential understanding of the calibration graph, the methods of standard additions and internal standardization, and absolute analysis are discussed. Chapter 4 covers instrumentation. Light sources, furnace designs and operations spectrometers, background correction methods, and single element and multielement spectrometric designs are considered. This chapter is well presented and easily understood, emphasizing discussions on the important Zeeman background corrections. Chapter 5 lays out methods for minimizing spectral, physical, and chemical interferences. Chapter 6 deals with sample preparation and introduction. Various digestion procedures, liquid matrices, gas sampling, direct solid sampling, preconcentration and separation methods, and speciation are included. Chapter 7 gives some practical hints for employing GFAAS to the analysis of real-world samples. Good laboratory practice and quality control are included here. Results can be accurate only when samples are collected, transported, stored, prepared, and measured properly—discussed in this chapter. The readers are also guided to method developments and troubleshooting. Chapter 8 covers commercial GFAAS instrumentation. Costs and analytical capabilities are compared. Consumables, training, and service are discussed. This chapter will provide the practical considerations in the selection for commercial instruments. Chapter 9 points out two future developments in GFAAS. The first one is to use laser diodes as the line source and the second one is to make the entire instrument portable. Appendix A briefly describes the historical development of GFAAS, with important references cited. Appendix B guides the reader into literature resources. Appendix C provides specific GFAAS operation conditions for a great variety of elements and offers procedures for preparing standard solutions. Finally Appendix D supplies a glossary for the spectroscopic and analytical terms employed. There also is an index for quick-referencing a subject in the book.

In summary, this book has achieved its goal as a practical guide. It will be useful to readers who are serious in learning the technique in detail and in employing the technique in the real world. It is written at a level suitable for readers of all sciences and is well suited as a textbook for an advanced undergraduate topic course, or for a topic workshop. The price also makes the volume an affordable textbook.

Kin C. Ng, *California State University at Fresno*

JA985652Q

S0002-7863(98)05652-2

Liquid Interfaces in Chemistry and Biology. By Alexander G. Volkov and David W. Deamer (University of California at Santa Cruz) and Darrell L. Tanelian and Vladislav S. Markin (University of Texas Southwestern Medical Center at Dallas). Wiley-VCH: New York. 1997. $95.00. x + 551 pp. ISBN 0-471-14872-5.

Liquid interfaces are ubiquitous. They play a critical role in many chemical, physical, and biological processes. Compared to bulk liquids, liquid interfaces, including liquid—gas, liquid—liquid, and liquid—solid, are much less understood. This is in part because it is generally difficult to study such liquid interfaces experimentally or theoretically, since the concentration of molecules of interest at the interfaces is extremely low compared to that of the adjacent bulk liquid. The past decade has witnessed a huge increase of research interest in the study of liquid interfaces, fueled in part by new experimental and theoretical methods that allow for more direct and detailed probing of liquid interfaces at the molecular level. These new studies based on, e.g., nonlinear optical spectroscopy and computer simulations have significantly advanced our understanding of the fundamentals underlying liquid interfaces.

This book is the first to present a comprehensive coverage of the fundamental concepts and principal applications of liquid interfaces with emphasis on liquid—liquid interfaces in chemistry and biology. It contains contributions from four leading experts representing bioelectrochemistry, membrane biophysics, and thermodynamics. The book starts with a nice introduction to the thermodynamic aspects of liquid interfaces. Topics covered include a basic introduction to classical thermodynamics, measurement of interfacial tension, and adsorption at liquid interfaces. The second part of the book focuses on electrified interfaces, dealing with topics ranging from internal potentials to electrocapiliarity and energetics of extraction. The third part of the book presents a detailed discussion of the structure of liquid interfaces which includes both experimental measurements and theoretical simulation results. The fourth part focuses on issues related to chemistry at liquid interfaces, with emphasis on two very important subjects: interfacial catalysis and light energy conversion at liquid—liquid interfaces (artificial photosynthetic systems). The last part of the book deals with a biologically significant system, namely, membranes. The discussion centers around membrane thermodynamics and electrostatics and mechanics of interfaces.

The book is well written and organized with many good examples to highlight the basic principles. There is also a good balance between experimental results and theoretical models and analysis. The book presents quite an extensive coverage of liquid—liquid interfaces, which is its primary focus, and deals little with two other important liquid interface systems, namely, liquid—gas and liquid—solid interfaces. This book provids adequate and up-to-date references to a large number of current and earlier publications relevant to the topics covered. The subjects covered are very important to the general chemical and biological communities. It is recommended reading for both practitioners and newcomers who wish to keep up with the rapid developments in liquid interfaces, especially those treading the line between fundamentals and applications.

Jin Z. Zhang, *University of California at Santa Cruz*

JA985615Z

S0002-7863(98)05615-7

Functional and Smart Materials: Structural Evolution and Structure Analysis. By Z. L. Wang and Z. C. Kang. Plenum Press: New York and London. 1998. $125.00. xxiii + 514 pp. ISBN 0-306-45651-6.

Functional materials have physical and chemical properties which are sensitive to changes in the environment (e.g., temperature, pressure, electric field, magnetic field, optical wavelength, adsorbed gas molecules, or pH). These include both organic and inorganic materials. *Smart materials* have physical structures which can sense, process, and actuate a response to a change in the environment. These include piezoelectric, magnetostrictive, electrostrictive, and shape-memory alloy devices. The ability to design and synthesize a system with these desired properties is a consequence of the early studies of structure—property relationships (e.g., *Structure-Property Relationships*, R. E. Newnham, Springer-Verlag, 1975). Over the past 20 years, tremendous advances have been made in the theoretical understanding and practical applications of structure—property relationships. The economic potential of these materials and the devices based on them is staggering.

Wang and Kang's book is limited to oxide-based materials and is divided into two parts. The first half contains a systematic discussion of the fundamental and derivative structures of the rutile, perovskite, and fluorite structure types. An excellent and detailed analysis of each of these fundamental structures shows how hundreds of related compounds have been designed and synthesized with very specific properties. The principles of soft chemistry (that is, the ability to prepare new oxides by modifying existing compounds under relatively benign temperature and pressure conditions) and the preparation of nanocrystals with various physical properties conclude Part I.

The second half of the book describes the principles and applications of structure determination using a number of relatively new and very sensitive methods, such as high-resolution transmission electron microscopy (HRTEM), convergent-beam electron diffraction (CBED), electron energy loss spectroscopy (EELS), and atom location by channeling-enhanced microanalysis (ALCHEMI).

References to the original literature are quite up-to-date, but a general bibliography to the many subjects introduced in this text is lacking. The excellent presentation of the various types of crystal structures