Additions and Corrections

Crystal Structure of the Anticancer Drug Cisplatin Bound to Duplex DNA [*J. Am. Chem. Soc.* **1996**, *118*, 12309−12321]. PATRICIA M. TAKAHARA, CHRISTIN A. FREDERICK, AND STEPHEN J. LIPPARD*

Pages 12312−12316: Each component of the stereoviews in Figures 1 and 3 should be rotated by 90°. We thank R. E. Dickerson for pointing out this error.

In addition, further refinement revealed that differences at base pair T8−A17 in molecules A and B are minimal, closely resembling those reported previously for molecule B. The newly refined coordinates have been deposited with the Protein Data Bank and the coordinates and revised parameters are available from the authors upon request.

JA975403M

S0002-7863(96)05403-6

Book Reviews *

Structural Electron Crystallography. By Douglas L. Dorset (Hauptman-Woodward Medical Research Institute, Inc.). Plenum Press: New York. 1995. xiii + 452 pp. $69.50. ISBN 0-306-45049-6.

Structural Electron Crystallography provides an updated account of an analytical technique which continues to gain importance in modern structural research. Consequently, the book will be of interest to chemists, structural biologists, and X-ray crystallographers who find electron crystallography an extremely valuable technique. The book is thoroughly referenced.

Discussions in *Structural Electron Crystallography* are largely confined to the use of diffraction intensities and images from single thin crystals. Most of the book is devoted to molecular organic crystals. There is little mention of fiber diffraction. Two brief chapters contain discussion on the quantitative study of inorganic structures and protein electron crystallography. There is some comment on instrumentation related to diffraction experiments on proteins. Structural biologists would be somewhat disappointed by this limited discussion.

Structural Electron Crystallography is divided into two parts. Part I provides theoretical and experimental background on structural electron crystallography. The section on Fourier transform pairs is particularly clear, although not for the novice. The relationship between a crystalline lattice and its diffraction pattern is described in mathematical detail. Systematic absences are explained well in considering the effect of plane group symmetry on the Fourier transform of a repeating mass distribution to its diffraction pattern. The presentation of notation in the section on crystal symmetry is a bit confusing, but if prior familiarity with notation is assumed, then unit cell determination methods can be easily followed and understood. The section on crystallization is quite thorough and lucid. Here, structural biologists will find a brief but well-referenced discussion on the reconstitution of transmembrane proteins and surface orientation of proteins.

Data collection techniques are described straightforwardly. In the chapter on crystal structure analysis, the solution to the phase problem is nicely explained, particularly the use of Patterson functions and direct phasing methods. Included in this chapter are the use of the Sayre equation, symbolic addition, the tangent formula, Patterson search technique and molecular replacement, density modification, and maximum entropy methods. Useful examples of treatment of real data sets are provided. Here, the text is particularly useful for X-ray crystallographers who wish to investigate structures by electron crystallography.

Part II describes specific examples of structure determination for different classes of molecular systems: molecular organics and inorganics, alkanes, alkane derivatives, lipids, linear polymers, and globular macromolecules. Many diverse examples are presented, which point out both common and unusual problems in experimental design and treatment of data. Suggestions for overcoming stumbling blocks are presented to show that correct structures can be determined directly from measured data and reasonable results can be obtained for a variety of materials with proper experimental parameters and appropriate treatment of data.

Several sections would be of particular interest to X-ray crystallographers who are interested in structural electron crystallography as a complementary technique to obtain details not obtainable from X-ray study of bulk specimens: alkanes, the use of Langmuir−Blodgett films for characterization of thin layers formed by alkane derivatives, monolayers formed by amphiphiles and unusual arrangements of natural waxes, liquid crystal structures, and polymers. Structural biologists would be particularly interested in the chapter on globular macromolecules. It is not a detailed overview, but rather a presentation of the three highest resolution structure analyses to date for membrane proteins: bacteriorhodopsin from *Halobacterium halobium*, light-harvesting chlorophyll *a*/*b*−protein complex, and porins. The latter provide the first benchmark to prove that high-resolution electron crystallography studies can arrive at a correct structure solution, in essential agreement with later X-ray crystal structure. The porin studies also provide direct observation of spontaneous rotational diffusion of a protein in a bilayer membrane. The chapter concludes with a discussion on the reliability and prospects for direct methods playing a significant role in phase refinement and extension of macromolecular structure.

Katherine A. Kantardjieff, *California State University−Fullerton*

JA9655045

S0002-7863(96)05504-7

Vesicles. Surfactant Science Series, Volume 62. Edited by Morton Rosoff (Long Island University). Dekker: New York. 1996. ix + 752 pp. $195.00. ISBN 0-8247-9603-9.

Chemists refer to a vesicle (or to a liposome) as a man-made submicrometer diameter spherical water droplet isolated from the bulk aqueous solution by a 3−4 nm thick bilayer which is composed of apposed surfactants (or phospholipids) whose apolar tails are in contact with each other. Synthetic vesicles, ever since their first preparation in the 1950s, have served as models for the biological membrane. Indeed, much of our current understanding of the physical−chemical properties of biomembranes and membrane-mediated signal transduction, ion transport, and metabolic processes has been derived from the investigations of synthetic vesicles and bilayer lipid membranes (BLMs). Considerable effort has also been invested in developing

*Unsigned book reviews are by the Book Review Editor.

synthetic vesicles and liposomes as containers and delivery agents for cosmetics, drugs, immunoagents, herbicides, pesticides, imaging agents, components of artificial photosynthesis, and metallic, magnetic, and semiconducting nanoparticles. Numerous accounts, reviews, and books have summarized different aspects of vesicle and liposome research.

The stated purpose of the present volume is to "present selected topics as signposts indicating the scope and direction of vesicle research". Seventeen individual review articles, mostly surveying research in the author's laboratories, are grouped into four different sections. Section I on Physical and Surface Chemistry is the longest. It contains 6 reviews, covering The Relationship and Interactions Between Lipid Bilayers Vesicles and Lipid Monolayers at the Air/Water Interface (Robert C. MacDonald); Physical and Chemical Aspects of Liposomes and Some of Their Applications (Tibor Hianiki, Angela Ottová-Leitmannová, and H. Tien); Formation and Structure of Reversed Vesicles (Hironobu Kunieda and Vijay Rajagopalan); Thermodynamics and Kinetics in Inhomogeneous Distribution of Lipid Membrane Components (Antonio Raudino and Francesco Castelli); Interaction of Surfactants and Phospholipid Vesicles (Tohru Inoue); and Shape Fluctuations of Vesicles (Shigeyuki Komura). Reviews in Section II, Methods are Characterization of Vesicles and Vesicular Dispersions via Scattering Techniques (John H. van Zanten); Fluorescence Probing of Vesicles Using Pyrene and Pyrene Derivatives (Guy Duportail and Panagiotis Lianos); and The Mechanochemistry of Lipid Vesicles Examined by Micropipet Manipulation Techniques (David Needham and Doncho V. Zhelev). Reviews in Section III, Drug Delivery, are Liposomes in Drug Delivery (Danilo D. Lasic); Liposomes and Lipidic Particles in Gene Therapy (Danilo D. Lasic and Rodney Pearlman); Liposomal Amphotericin B (AmBisome): Realization of the Drug Delivery Concept (Gary Fujii); and Vesicles as Topical Drug Delivery Systems (Rimona Margalit). Reviews in the last Section, Diverse Applications, are Photoenergy-Harvesting on Two-Dimensional Vesicular Assemblies (Masahiko Sisido); Vesicles as Imaging Agents (Colin Tilcock, Depank Utkhede, and Grant Meng); Liposomes in In Vivo Immunology (Eric Claassen); and Triggered release from Liposomes Mediated by Physically and Chemically Induced Phase Transitions (Oleg V. Gerasimov, Yuanjin Rui, and David H. Thompson).

As seen from the titles the topics, with the possible exception of those in the Drug Delivery section, are rather diverse. The scholarship, referencing, and style of these seventeen articles are also varied. By and large, the literature citations are up to 1995. I for one would have liked to see a chapter (presumably written by the editor) in which the entire current state of the art of vesicle research and its future potentials is critically examined. Although I have enjoyed reading these eclectic reviews, I would not run off to spend $195 on the book.

Janos H. Fendler, *Syracuse University*

JA965734J

S0002-7863(96)05734-4

Advances in Gas Phase Ion Chemistry. Vol. 2. Edited by Nigel G. Adams and Lucia M. Babcock (University of Georgia). JAI Press: Greenwich. 1996. x + 266 pp. $97.50. ISBN 1-55938-703-3.

This volume, as the one preceding it, is intended to provide the reader with, in the editors' own words, "up-to-date information on developments in forefront areas" and "a broad base to view the subject as a whole". The book delivers on both counts. All the contributing authors are active researchers and recognized leaders in their fields, and they all largely focus on their own work. All but one of the articles contain up-to-date references through 1994 and, in some cases, into 1995. An impressive and exciting range of forefront topics is covered. Also, the balance among theory, experiment, and application sought by the editors is largely achieved. The blend is sufficient to make this volume of interest to both experimentalists and theoreticians.

The volume begins strongly with a report by Philip Brooks and Peter Harland of their studies of the influence of molecular orientation on electron transfer between neutral atoms and molecules and on electron-impact ionization. Insights into steric effects operating in such processes are provided which surpase "chemical intuition". Terrance McMahon follows with a survey of the application of high-pressure and low-pressure techniques currently available in his laboratory which are useful in elucidating fundamental aspects of unimolecular dissociation of chemically activated ions and their unimolecular stabilization (by infrared emission). He also describes his pioneering experiments which revealed the unimolecular dissociation of cluster ions induced by the absorption of infrared radiation. This chapter is nicely complemented by a lucid description by Robert Dunbar of the experimental techniques involving measurements of time-resolved photodissociation thresholds, the kinetics of radiative association, and dissociation by ambient infrared radiation which he has developed for the derivation of accurate ion-dissociation energies. The application of these techniques is illustrated with specific examples, and an appendix provides constructive guidelines on the application of phase-space and RRKM theory in fitting rate data. Peter Schreiner, Henry Schaefer, III, and Paul von R. Schleyer present ab initio electronic-structure calculations of a number of topical hypercoordinate carbonium, silonium, and germonium ions and neutral analogues incorporating dihydrogen subunits which accurately reproduce available experimental data. The unique nature of the "highly fluxional" methonium ion which undergoes complete hydrogen scrambling is emphasized, and a correlation is presented between the dihydrogen stretching frequency and dissociation energy. Gregory Gellene briefly presents his recently-developed theory of symmetry-induced kinetic isotope effects which is then tested by its application to several ion−molecule reactions for which order-of-magnitude isotope effects have been observed. Suggestions for future experimental investigations of ion−molecule reactions are made which would be suitable for further testing. John Bartmess reviews the role of solvation, counterions, and structure on the chemical reactivity of negative ions. Using specific examples for illustration, he stresses both similarities and differences in chemical behavior between the gas phase and solution. The final chapter by Berk Knighton and Eric Grimsrud deals with the influence of pressure on ion reactivity. This contribution is particularly welcome since this variable is generally underemphasized in gas-phase ion chemistry research. Attention is drawn to both the physical and possible chemical role of buffer gases. Six moderate-to-atmospheric pressure techniques currently in favor are critically evaluated, and results obtained with these techniques are compared in tabular form. A strong case is made for further studies of ion reactivity at elevated pressures.

Aside from providing state-of-the-art accounts of forefront areas of research in ion chemistry written by experts in the field, this volume also affords motivation for further studies in new research directions. The latter is most stimulating and adds to the already excellent value this volume has for researchers and graduate students working in gas-phase ion chemistry and related fields.

Diethard K. Bohme, *York University*

JA965647R

S0002-7863(96)05647-8

Catalysis of Organic Reactions. Edited by Russell E. Malz, Jr. (Uniroyal Chemical Company, Inc.). Marcel Dekker, Inc.: Monticello, NY. 1996. xvi + 496 pp. $195.00. ISBN-8247-9807-4.

This book is based on the papers and posters presented at the 16th Conference on Catalysis of Organic Reactions which was held in Atlanta, Georgia. The papers presented by over 130 international experts from business and academia cover the study of catalysis as it relates to organic synthesis—highlighting both theoretical and applied aspects of the field. Providing a historical overview of organic reaction mechanisms on metal surfaces, the book focuses on economically valuable industrial and pharmaceutical chemicals, commercial improvements in homogeneous catalysts, the laboratory handling of catalysts, uses for both new and established processes, applications of newly developed systems, heterogeneous and homogeneous hydrogenations, and oxidations as well as acid catalysis.

JA9657770

S0002-7863(96)05777-0