# *Additions and Corrections*

**First Observation of Light-Induced Excited Spin State Trapping for Iron(III) Complex** *J. Am. Chem. Soc.* **2000**, *122*, 7126]. SHINYA HAYAMI, ZHONG-ZE GU, MOTOO SHIRO, YASUAKI EINAGA, AKIRA FUJISHIMA, AND OSAMU SATO*

The cell parameters in ref 25 are incorrect. The correct parameters are $a = 10.947(6)$ Å, $b = 11.741(6)$ Å, $c = 10.054(5)$ Å, $\alpha = 107.12(3)°$, $\beta = 91.96(1)°$, $\gamma = 80.51(3)°$, $V = 1217(1)$ Å$^3$, $Z = 2$, and $D_{calcd} = 1.548$ g cm$^{-3}$.

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# *Book Reviews*

**High-Temperature Superconductors: Materials, Properties, and Applications**. By Rainer Wesche (Ecole Polytechnique Federale de Lausanne, Switzerland). Kluwer Academic Publishers: Boston, Dordrecht, and London. 1998. xii + 435 pp. $102.00. ISBN 0-7923-8386-9

This book offers an excellent introduction to the research completed prior to 1998 in the field of high-temperature superconductivity. An overview is provided of the known high-$T_c$ phases along with their physical properties. The book contains a large number of useful tables and illustrations and provides a good mixture of mathematical expressions alongside qualitative descriptions of the relevant physical phenomena. The latter feature is lacking in many of the prior books on related subject matter, making this new contribution very suitable for the materials chemistry research community. Furthermore, it is expected that this book will serve as a useful reference for advanced undergraduate and graduate materials chemistry courses.

The book is organized in the following manner. Chapter 1 provides a brief introduction to the field of superconductivity. Chapter 2 contains a discussion of the characteristic electrical, magnetic, tunneling, electrodynamic, and thermodynamic properties exhibited by these superconductors. A survey of the major classes of cuprate superconductors, their crystal structures, transition temperatures and anisotropic conductivity characteristics is provided in Chapters 3 and 4. Chapters 5−8 emphasize conductor fabrication and high-current bulk applications for the cuprate superconductors.

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**Computational Methods in Surface and Colloid Science. Volume 89. Surfactant Science Series**. Edited by Małgorzata Borówko (Maria Curie-Skłodowska University). Dekker: New York. 2000. ix + 941 pp. $225.00. ISBN 0-8247-0323-5.

Thanks to the great advances in computers during the past 50 years, theoretical methods have had an extraordinary development that allows us to study all kinds of materials, ranging from nanoscopic atoms to macroscopic bulk materials. New methods have been created for studying, designing, and predicting properties in new materials for a wide variety of fields. Computational specialists powered with state-of-the-art computers have advanced the study of matter, correcting experimental literature values, clarifying several experiments, and helping to find new and better mechanisms of several phenomena occurring in materials. The central point is that computational methods complement their experimental counterparts and advance our knowledge and insights into the intricacies of matter. Methods for individual atoms have reached extraordinary degrees of precision that in several practical cases yield results in full agreement with experimental observations. These methods have expanded to the study of molecules, which are solved using data from their constituent atoms. The next step in this progression would be the study of surfaces as a collection of atoms or molecules. That is the focus of this excellent book.

Prof. Borówko has compiled a volume focusing on computational methods applied to surface and colloid science. It is the goal of the editor to cover the advanced theoretical approaches to interfacial systems. We have to praise her ability to put together such a large amount of high-quality articles, which begin with a discussion of the fundamental ideas, followed by a digestible, though complete, mathematical description of the models, and end with simple to more advanced applications.

In Chapter 1, Schoen reviews the principles of simulations from soft-condensed matter and covers Monte Carlo simulations for several microscopic structures, shear-induced transitions, and liquid−gas equilibrium in confined systems. Chapter 2, on the other hand, focuses on adsorption at surfaces, including models and surface potentials, Monte Carlo simulations, and path-integral Monte Carlo (quantum effects). The use of integral equations for simple fluids (hard-sphere-based systems), polydisperse fluids, and inhomogeneous fluids is the subject of Chapter 3, whereas nonuniform associating fluids, associative potentials, and directional forces are the subjects of Chapter 4. This chapter also includes illustrations on the use of density functional formalisms and Monte Carlo simulations

In Chapter 5, Patrykiejew and Borówko bring us the basic concepts and models for simulations of adsorption in heterogeneous surfaces, including wetting phenomena, and in the succeeding chapter, Pizio addresses the subject of adsorption in random porous media, including partly quenched, inhomogeneous, and ionic systems. Chapter 7 by Spohr reviews molecular simulations of water and solutions at interfaces, including electrochemical interfaces, electrolyte solutions, water and inorganic material interfaces, and water/membrane interfaces. Albano, in Chapter 8, discusses modeling and simulation of chemical reactions at surfaces, focusing on catalytic oxidation and catalyzed reactions, and in Chapter 9, Kreuzer and Payne review the lattice gas models for the kinetics of adsorption, desorption, and reaction at surfaces.

In Chapter 10, Kremer and Müller-Plathe focus on molecular dynamics simulations and Monte Carlo methods for dense polymers. Milchev addresses the techniques for simulating living polymers and giant micelles in Chapter 11, including models, methods, and scaling predictions, and continues with a study of the adsorption of polymer chains on hard surfaces in Chapter 12. In Chapter 13, Schmid reviews chain, lattice spin, and phenomenological Ginzburg−Landau models for the study of surfactants and includes some interesting applications, and Holyst, Ciach, and Gózdz in Chapter 14 discuss several models related to ordering in microemulsions, ranging from the basic functional models to the most sophisticated extended ones.

Schmidt describes selected simulations of colloidal systems, including liquid mixtures, confined liquids, freezing, liquid crystals, colloids, shear, and rheology in Chapter 15. This is followed by Murad and Powles's discussion of the methods for fluids in contact with

semipermeable membranes, like Monte Carlo and molecular dynamics, and their applications to electro-osmosis and reverse osmosis. The book concludes with a chapter by Stafiej and Badiali containing a detailed description of their point of view of the double-layer theory, and one by Müller-Krumbhaar and Saito in which most of the models and concepts of importance for the study of crystal growth and solidification are analyzed.

This book is a must for any practitioner in surface science and a good reference for anyone working in computational fields related to chemistry, physics, materials science, computer science, and chemical engineering. Undoubtedly, the strong overlap between these fields and the chapters in Borówko's book will yield fruitful ideas. The way the articles are written allows the interested and casual reader to be immediately updated on cutting-edge research in the exciting field of surface and colloid science.

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**Nucleic Acids: Structures, Properties, and Functions**. By Victor A. Bloomfield (University of Minnesota), Donald M. Crothers (Yale University), and Ignacio Tinoco, Jr. (University of California, Berkeley). University Science Books: Sausalito, CA. 2000. xii+ 794 pp. $85.00. ISBN 0-935702-49-0.

It was a pleasure to review this book, which is a suitable textbook for graduate courses in physical biochemistry. It provides an update for the widely used text by Cantor and Schimmel (*Biophysical Chemistry*; Freeman: San Francisco, 1980). The authors first present fundamental information about nucleic acid bases and follow this overview with a chapter on chemical and enzymatic methods. X-ray diffraction methods, ranging from the original fiber diffraction studies on DNA to the more recent single-crystal diffraction methods, are discussed in Chapter 4. Chapter 5 focuses on the application of NMR to the study of the structure and dynamics of DNA and DNA complexes in solution. This area is well covered and significant, since not all structures can be solved by X-ray diffraction.

Chapter 6 reviews electron and vibrational spectroscopy, such as fluorescence, phosphorescence, CD, linear dichroism, IR and Raman scattering, whereas Chapter 7 describes in detail theoretical methods, such as molecular mechanics, molecular dynamics, and Monte Carlo methods, such as simulated annealing. The different secondary and tertiary structures of RNA and DNA are described in Chapter 8, and the size and shape of nucleic acids in solution determined by various physicochemical methods are presented in Chapter 9. Techniques such as electrophoresis, sedimentation coefficients, diffusion, viscosity, small-angle scattering, light scattering, and electron microscopy are also presented.

Supercoiled DNA is elegantly covered in Chapter 10—the authors clearly explain the usually difficult concepts of linking number, twist, and writhing. This reviewer has never seen this presented before in such a lucid manner. Chapter 11 considers the problem of treating DNA/RNA in aqueous solution. Since DNA is a polyelectrolyte, the importance of electrostatic interactions is critical. Thus, the authors pay particular attention to hydration in ionic solutions as well as binding of metal ions and polyamines and mixed aqueous−nonaqueous solvents. References to exact treatment of the Poisson−Blotzmann equation for the DNA polyelectrolyte in water are also given.

Chapter 12 reviews the interactions of DNA with equilibrium-binding drugs as well as covalent DNA adducts, and an extensive Chapter 13 presents the various motifs for protein−DNA complexes. The more limited protein−RNA motifs are described as likely to be expanded when more structures become available in the literature. The concluding chapter deals with the higher-order structure of DNA in chromatin. The description of the nucleosome structure is well presented but has become a little dated since the publication of the 2.5-Å resolution X-ray structure by Richmond (1997).

I would recommend this text for graduate classes in physical biochemistry. Because of the rapid progress in the field, it should be supplemented with material from the more recent literature. The authors might consider publishing a supplementary guide with some of the more recent X-ray and NMR structures to further characterize the three-dimensional motifs present in the field of structural biology.

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**Advances in Strained and Interesting Organic Molecules. Volume 8**. Edited by Brian Halton (Victoria University of Wellington). JAI Press: Stamford, CT. 2000. xii + 264 pp. $115.00. ISBN 0-7623-0631-9.

This monograph features six chapters, each written by a leading authority in the subject field, on diverse topics related to strained and theoretically interesting molecules. The first chapter, entitled "Natural and Nonnatural Planar Carbon Networks: from Polymeric Models to Oligomeric Substructures", by M. M. Haley and W. B. Wan, focuses on synthetic aspects of the field and provides a comprehensive overview; both early studies and the latest developments are included. A minor complaint about this chapter is the repeated misuse of the term "Diels−Alder" to describe what is actually an electrocyclic ring closure.

The following article, "Recent Developments in Strained Cyclic Allenes", by M. Balci, emphasizes recent developments in the generation and reactivity of the title compounds. It is organized according to ring size and features allenes in carbocyclic and heterocyclic five- to nine-membered ring systems.

The third chapter is entitled "Strain and Structure of Sterically-Congested Triplet Carbenes", by H. Tomioka. This article is very physically and theoretically oriented and emphasizes the effect of substituents on the geometry at the carbene carbon of the title compounds. Virtually all of the recent references are from the author's research group.

Chapter 4, "Synthesis and Chemistry of Strained Carbohydrates: Oxabicyclo[4.1.0]heptanes", by G. S. Cousins and J. O. Hoberg, covers the synthesis and reactivity of cyclopropanes, epoxides, aziridines, or episulfides fused to polyoxygenated pyran derivatives. This is followed by M. North's chapter, "Exploiting the Strain in [2.2.1]Bicyclic Systems in Polymer and Synthetic Organic Chemistry", which reviews polymer (ROMP) and small-molecule synthesis using the title compounds, giving special emphasis to asymmetric synthesis. A large fraction of the data presented is comprised of recent results from the author's laboratory.

The final chapter, "Azirines and Aziridines Revisited", by K. M. R. Rai, appears to be comprehensive and discusses new and old reactions of these ring systems. Although this article is well illustrated, the awkward positioning of schemes and equations makes it difficult to find the illustrations for numbered compounds.

The articles appear to be timely compilations of the subject material, are clearly written and well illustrated in most cases, and provide excellent background discussions and modern perspectives on the field. There are references as recent as 1999, and 25−50% of them fall in the range 1995−1999. The index is brief and, unfortunately, appears to omit many of the specific topics discussed.

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