1a, lane 4 compared to lane 5) suggests that Tc recognizes a metal binding site and that the binding of the metal to the protein is considerably weaker than that of the chelated complex. Alternatively, the difference may relate to an induced and noninduced conformation of the repressor protein regulated by the allosteric effector Tc. Thus in the drug-bound conformation, the redox active Fe^{2+} may be more localized and in closer proximity to the peptide backbone of the binding pocket.

In conclusion, these experiments show for the first time that the redox-active $Tc\cdot Fe^{2+}$ complex binds to a specific site on the Tet repressor protein and can be used to define contact points between Tc and the repressor by site-specific proteolysis. It is noteworthy that the most prominent cleavage site between Arg-104 and Pro-105 is very near His-100, consistent with a pH-dependent binding study which suggested that a proton on an imidazole and Mg^{2+} compete for the same binding site on Tc.[4] The cleavage site between Glu-147 and Asp-148 points to possible binding between the carboxylate of either one of these amino acids and the Tc metal chelate. Most likely these contacts represent coordination sites to the chelated metal in which Tc serves as a template. Together with residues Ala-56 and Ile-57, they probably form the protein surface in contact with the Fe^{2+}. X-ray studies now in progress will obviously provide more insight into the binding of Tc with its repressor.

Acknowledgment. We thank Jeff Hulmes and Sjaak Reumkens for N-terminal sequencing and useful comments, Jörg W. Metzger for performing the ISMS analyses, and Winfried Hinrichs, Michael Niederweis, and Wei-Dong Ding for helpful discussions. This work was supported by a grant from the Wilhelm Sander Stiftung.

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(17) The Mg^{2+}/Fe^{2+} competition experiments are consistent with a k_{diss} of 1.2×10^{-2} min^{-1} or a $t_{1/2}$ of 1 h for the dissociation of Tet repressor $Tc\cdot Mg^{2+}$ complex measured by Tc fluorescence.[4]

Additions and Corrections

Amide Cuprate Reagents as a New Class of Nitrogen Nucleophiles. Application to Asymmetric Synthesis of β-Lactams [*J. Am. Chem. Soc.* **1992**, *114*, 5427–5429]. Yoshinori Yamamoto,* Naoki Asao, and Tadao Uyehara

Page 5428: The *R* configuration is produced in the R^3R^4NM reaction whereas the *S* configuration is obtained in the high pressure induced reaction of R^3R^4NH:[9] This sentence should read as follows: It is noteworthy that the sense of chiral induction in the R^3R^4NM addition to the 8-phenylmenthyl derivatives (**1f**) is opposite to that in the high pressure induced reaction of R^3R^4NH.[9] We thank Professor J. d'Angelo for calling this error to our attention.

Page 5428, ref 9: (*S*)-β-amino ester should read (*R*)-β-amino ester.

Carbon Dioxide Complexes via Aerobic Oxidation of Transition Metal Carbonyls [*J. Am. Chem. Soc.* **1992**, *114*, 6579–6580]. Peng-Fei Fu, Masood A. Khan, and Kenneth M. Nicholas*

Due to a simple calculational error the 2:1 stoichiometry reported for the reaction of $Cp'_2Nb(CO)CH_2Ph$ with O_2 (eq 1 and Figure 2, p 6580) is incorrect. The corrected concentration of **1a** is 0.18 mmol. From the corrected concentration of **1a** and several independent repetitions of the experiment a consistent stoichiometry of 1.0:1.0 ± 0.1 is obtained. We are currently seeking to identify the fate of the extra O atom.

Rapid Photopolymerization of Immunoprotective Gels in Contact with Cells and Tissue [*J. Am. Chem. Soc.* **1992**, *114*, 8311]. Chandrashekhar P. Pathak, Amarpreet S. Sawhney, and Jeffrey A. Hubbell*

In this recently published paper on the photopolymerization of water-soluble macromers for the encapsulation of tissues, we neglected to provide references on the eosin/triethanolamine photoinitiation system we used.[1-3] We regret this oversight.

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(1) Chesneau, E.; Fouassier, J. P. *Angew. Makromol. Chem.* **1985**, *135*, 41.

(2) Neckers, D. C.; Raghuveer, K. S.; Valdes-Aguilera, O. *Polym. Mater. Sci. Eng.* **1989**, *60*, 15.

(3) Valdes-Aguliera, O.; Pathak, C. P.; Shi, J.; Watson, D.; Neckers, D. C. *Macromolecules* **1992**, *25*, 541.

*Book Reviews**

Chemistry of Atmospheres. Second Edition. By Richard P. Wayne (University of Oxford). Clarendon Press: Oxford, England. 1991. xiii + 477 pp. $89.00 hardcover. $35.95 paperback. ISBN 0-19-655571-7.

This book provides an excellent introduction to atmospheric chemistry. The author presents a comprehensive overview of the major issues and provides the background in chemistry, physics, and biology needed to understand these issues. This second edition includes some of the important new developments of the last decade, such as the appearance of the Antarctic ozone hole and the subsequent realization that heterogeneous processes play a critical role in the chemical balance of the atmosphere. Flyby missions to the outer planets in the solar system and preliminary results are included in this book.

The first chapter discusses the composition of the atmospheres of Earth and the other planets, highlighting the special nature of Earth's atmosphere and its ability to support life. Chapters 2 and 3 provide an introduction to the topics in atmospheric physics, meteorology, and chemistry that are needed to understand atmospheric processes. Chapters 4–7 deal with different aspects of the Earth's atmosphere, starting with the ozone layer and the stratosphere in Chapter 4. Chapter 5 discusses tropospheric chemistry and air pollution, ion chemistry in the region above 60 km is covered in Chapter 6, and Chapter 7 discusses airglow due to electronically and vibrationally excited species in the atmosphere. The final two chapters of the book deal with the atmosphere of other planets and the evolution of atmospheres.

This book is highly recommended as either an introductory textbook or a general reference for the interested scientist. Anyone with an undergraduate level background in physical chemistry should find this book highly readable and a valuable resource.

Leah R. Williams, *SRI International*

Xenobiotics and Food-Producing Animals. Metabolism and Residues. Edited by D. H. Hutson (Shell Research Limited), D. R. Hawkins (Huntingdon Research Centre), G. D. Paulson (U.S. Department of Agriculture), and C. B. Struble (Hazleton Laboratories). American Chemical Society: Washington, DC. 1992. xii + 256 pp. $58.95. ISBN 0-8412-2472-2.

This book was developed from a symposium sponsored by the Division of Agrochemicals of the ACS and the International Society for the Study

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*Unsigned book reviews are by the Book Review Editor.

of Xenobiotics at the Fourth Chemical Congress of North America (202nd National Meeting of the ACS) in New York on August 25–30, 1991. After a preface by the Editors, it contains 16 chapters organized under the following headings: Veterinary Drugs: Use and Regulation; Methodology of Xenobiotic Metabolism; and Metabolism and Disposition. There are indexes of authors, their affiliations, and subjects.

Industrial Applications of Surfactants III. Edited by D. R. Karsa (Harcros Chemicals (U.K.) Limited). Royal Society of Chemistry: Cambridge. 1992. viii + 278 pp. £47.50. ISBN 0-85186-227-6.

This book was developed from a symposium sponsored by the Royal Society of Chemistry (U.K.) on Industrial Applications of Surfactants, 16–18 September 1991. After an overview entitled The Market for Industrial Surfactants in the 1990s by A. H. Turner and J. H. Houston, there are 14 chapters in typescript form organized under the following headings: Innovation; Anionic Surfactants; Nonionic Surfactants; Cationic and Amphoteric Surfactants; and Applications. There is a brief Subject Index.

Crystallographic Computing 5. From Chemistry to Biology. Edited by D. Moras, A. D. Podjarny, and J. C. Thierry (CNRS, Strasbourg). Oxford University Press: New York. 1991. xiv + 480 pp. $75.00. ISBN 0-19-855384-6.

This book contains papers, in typescript form, presented at the International School on Crystallographic Computing held at Bischenberg, France, 29 July–5 August 1990. There is a short preface by the editors followed by 35 papers organized under the following headings: Data Collection and Analysis; Program Packages; Solving the Phase Problem; Refinement; and Structure Analysis, Modelling, and Databases. There are 20 pages of Poster Abstracts but no indexes.

Organic Electronic Spectral Data. Volume XXVIII, 1986. Edited by John P. Phillips, Dallas Bates, Henry Feuer, and B. S. Thyagarajan. Interscience-John Wiley and Sons: New York. 1992. xvi + 9338 pp. $168.00. ISBN 0-471-58588-2.

This volume continues a series begun in 1956. It covers approximately 95% of the ultraviolet–visible spectra published in 165 journals throughout the world in 1986. The entries, in typescript form, are listed in order of the molecular formula according to the index system of Chemical Abstracts. There is a list of the journals abstracted and an index of the references.

Homogeneous Transition Metal Catalyzed Reactions. Advances in Chemistry Series 230. Edited by William R. Moser (Worcester Polytechnic Institute) and Donald W. Slocum (Western Kentucky University). American Chemical Society: Washington, DC. 1992. xiv + 626 pp. $139.95. ISBN 0-8412-2007-7.

This book was developed from a symposium sponsored by the Catalysis and Surface Science Secretariat of the ACS. After a one-page preface by the Editors, the book contains 41 chapters organized under the following headings: Spectroscopy and Mechanism; Asymmetric Induction and Shape Selectivity; C-H Activation; Carbonylation and Synthesis Gas Conversion; General Functionalization; and Oligomerization and Polymerization. There are indexes of authors, their affiliations, and subjects.

Photochemistry. Volume 23. A Specialist Periodical Report. Edited by D. Bryce-Smith (University of Reading) and A. Gilbert (University of Reading). The Royal Society of Chemistry: Cambridge, U.K. 1992. xvii + 556 pp. £145.00. ISBN 0-85186-215-2.

The most recent version of this venerable review series (Specialist Periodical Reports) has few changes from the established format. Volume 23 covers the photochemical literature from July 1990 to July 1991. As has been the tradition, each of the reporters simply summarizes the year's papers without attempting any sort of critical evaluation. The reports are meant to be comprehensive, rather than selective. The value of such a review source is that the reader can be made aware of all work in his/her area of interest. The volume is divided into five parts. The first part covers physical aspects of photochemistry. This includes much of the work on electron transfer processes, instrumentation, dye photophysics, and energy transfer. The second part covers organic photochemistry. It is by far the largest part and is further subdivided into chapters on carbonyl compounds, enones, alkenes and alkynes, aromatic compounds, photo redox processes, heteroatomic species, and photoelimination. The third part reviews polymer photochemistry. Part IV deals with solar energy conversion and is the smallest containing only 48 references. Part V is a special review on surface photochemistry. The latter covers material from the last 5 years. This is a welcome development, and one hopes it will be continued in future volumes.

Starting with the previous volume, inorganic and organometallic photochemistry is no longer covered. Literature references are included at the end of each part (or chapter). There is a cumulative author index, but no subject index. The senior reporters, Bryce-Smith and Gilbert, present "personal and highly subjective assessments of important developments" in the field at the beginning of the volume (albeit with no references to the papers being discussed).

Generally speaking, this is an invaluable resource for all researchers in photochemistry. The field is now so large and diverse that it is impossible to keep up with all developments in the course of normal reading. This series will continue to be important. However, several changes ought to be contemplated for future volumes. One weakness is the way in which the topic is subdivided. For example, if one is interested in the photochemistry of uracil derivatives, it is not clear if the reports on carbonyl compounds, enones, heteroatomic species, or aromatics should be consulted. Likewise a number of interesting Norrish type II reactions are reported in the polymer section (in the context of photoinitiation) rather than in the carbonyl chapter. There is probably no way to subdivide the topic to the satisfaction of everyone. One way to address this issue would be to include a cumulative subject index. A chapter dealing specifically with photobiology (the molecular aspects) would also increase interest in the series.

Daniel E. Falvey, *University of Maryland*

Silicate Crystal Chemistry. By Dana T. Griffen (Brigham Young University). Oxford University Press: New York and Oxford. 1992. ix + 442 pp. $59.00. ISBN 0-19-504442-8.

This book, aimed principally at graduate courses in mineralogy and crystal chemistry, has been designed to bridge the gap between monograph series such as Reviews in Mineralogy and general undergraduate texts.

This book on the crystal chemistry of the silicates, by far the most widespread and important of the rock-forming minerals, is divided into two main sections. The first is a systematic descriptive study of the main silicate structure types, organized according to a decreasing degree of tetrahedral polymerization and so beginning with the polymorphic form of silica, continuing with feldspars, micas, pyroxenes, amphiboles, and aluminum silicates, and concluding with the orthosilicate olivines and garnets. The second section covers the supporting concepts, including crystal symmetry and space groups, phase diagrams, and the use of instrumental methods in mineralogy.

The key to the excellent descriptive chapters has been the judicious selection of material from the mass available. Each of these chapters presents a superbly illustrated treatment of the more important members of the class concerned, together with their properties and their inter-relations. As is appropriate for a graduate text, all of these descriptive chapters have full references to the primary literature, which carry the treatment up to 1989.

The second section of this book is rather less satisfactory, particularly so in the chapters on instrumental methods and on bonding models. Two-page treatments of important topics such as powder diffraction, crystal-structure determination, solid-state NMR spectroscopy, or ligand-field theory are of very little value in themselves and could only really be justified as guides to other sources of information. Unfortunately none of the chapters in this section carries any references or suggestions for further reading. On the other hand, the excellent treatment here of crystal symmetry is effectively self-sufficient, even though the chapter on the determination and interpretation of phase diagrams would also benefit from references to more specialist sources.

Christopher Glidewell, *University of St. Andrews, Scotland*

Chemistry of High Temperature Superconductors. Edited by C. N. R. Rao (Indian Institute of Science). World Scientific: Singapore, New Jersey, London, and Hong Kong. 1991. viii + 509 pp. $82.00. ISBN 981-02-0805-7.

The premise of this book is well founded, but unfortunately this premise is only poorly realized due to the uneveness of the text and low production values. A mixed collection of authors leads to 18 chapters varying in quality and utility from excellent to questionable. The editor has done well in assembling a multinational group of authors which tends to give a good overall view of superconductor research worldwide. However, poor editing has meant that in some cases the level of English usage is so poor as to leave the reader struggling with the language rather than concentrating on the science.

There are several fine chapters discussing the influence of hole or electron concentrations in dictating superconducting properties, and these relationships between structure and superconductive properties are the strongest emphasis of this volume. I was surprised to find, however, that there was no coherent discussion of the purely synthetic aspects of these materials. For example, the chapter by Gopalakrishnan on Bi, Tl, and Pb materials makes numerous passing references to the "stringent" conditions of synthesis without ever really describing such conditions in detail. I would have found a chapter dedicated to only this aspect—a "recipe" chapter—a very useful addition and one which I had anticipated given the title of this volume.

The information content of this volume is certainly high (particularly for the YBCO superconductor), but actually tracking down this information is painfully difficult. This is in large part due to the lack of an index, which for a volume of this sort I find unforgivable. Finally, the complete lack of uniformity in the camera-ready text (fonts, reference format, and justification styles—in one case to a hideous extent) reflects poorly on the editing process and gives the book the look of a hastily thrown together jumble of disparate articles.

Overall, this book has utility as a reference source for the dedicated superconductivity researcher; but the more casual reader will find it unsatisfactory on several fronts, and for those readers there are other better volumes now available.

Norman Herron, *E. I. du Pont de Nemours and Co.*

Organic Photochemistry. Volume 11. Edited by Albert Padwa (Emory University). Marcel Dekker: New York. 1991. xv + 445 pp. $165.00. ISBN 0-8247-8561-4.

This volume is a collection of two reviews pertaining to the physical and synthetic aspects of di-π-methane rearrangements with additional reviews concerning the photochemistry of carbenium ions and hydrogen atom abstraction by carbonyl compounds and a topical essay on the photochemistry of matrix isolated species. Each of the chapters are extensively illustrated to support the text, and the volume contains a large number of references for further reading.

Chapter 1, by Howard Zimmerman, provides the reader with a brief introduction to the di-π-methane rearrangement before addressing, in some detail, questions that have arisen since the subject's last review. The chapter includes numerous examples of the rearrangement that are used to describe the mechanistic basis for regioselectivity and to provide insight as to the effects imparted by excited state multiplicity. Finally, the author addresses the question of stepwise vs direct mechanisms in the di-π-methane rearrangement and gives several examples that pertain to the reversibility of the reaction.

Chapter 2 is a thorough review of the oxadi-π-methane rearrangement by Martin Demuth. The author begins by presenting a photophysical discussion followed by an exposition dealing with the efficiency of the oxadi-π-methane rearrangement as it is perturbed by substitution patterns and competition with Norrish Type I reactions. The remainder of the chapter is devoted to the synthetic utility of the reaction and in particular to the preparation of enantiomerically pure materials that are used in the preparations of sesquiterpenes. The review concludes with a brief outline of the limitations of the oxadi-π-methane rearrangement and introduces the azadi-π-methane rearrangement as an alternative for those compounds, such as β-γ-unsaturated aldehydes, which do not undergo the former reaction.

Chapter 3, by Ronald Childs and Gary Shaw, provides an examination of the photochemistry of carbenium ions. The scope of the material is quite large, but it is organized in a logical fashion. The review contains 273 references to the excited state chemistry of these interesting species. This review is very descriptive for photochemical reactivity within classes of ions, and attempts are made to describe the mechanisms of reaction, albeit this is difficult, since the mechanistic photochemistry of carbenium ions is not at all well understood.

The photoinduced hydrogen abstraction reactions of carbonyls are reviewed by Peter Wagner and Bong-Ser Park in Chapter 4. The chapter contains nearly 400 references and makes good use of illustrations to explain conformational, angular, and distance dependencies of the abstraction reactions. The bulk of the review is devoted to intramolecular hydrogen abstractions with shorter essays concerning photophysics, energetics, charge-transfer initiation, and the radical processes that follow bimolecular hydrogen abstraction. The authors conclude by examining the potential use of photoinduced hydrogen abstraction reactions as radical clocks.

The photochemistry of nitrenes, carbenes, and excited state triplets isolated in low temperature matrices is discussed in Chapter 5 by Matthew Platz, Elisa Leyva, and Karl Haider. The review is interesting in that it does not attempt to be exhaustive, but illustrates the secondary photochemistry of matrix isolated species by focusing on phenylnitrene, diphenylcarbene, mesitylene triplets, and benzylic halides. This format has permitted the authors to describe the mechanistic aspects of these reactions in great detail. All of the sections include tabulated data, as well as absorption, emission, and EPR spectra.

This volume is quite diversified with respect to topics and contains a wealth of information for those interested in synthetic, physical, or spectroscopic aspects of organic photochemistry. Volume 11 would make an attractive addition to any physical sciences library.

Walter H. Owens, *Rice University*

Handbook on the Physics and Chemistry of Rare Earths. Volume 14. Edited by K. A. Gschneidner, Jr. (Iowa State University) and L. Eyring (Arizona State University). North Holland: Amsterdam, Oxford, New York, and Tokyo. 1991. xvi + 484 pp. $228.50. ISBN 0-444-88743-1.

As described by the editors in the preface, the contents of this volume represents a departure from the stated goal of previous volumes to integrate the chemistry and physics of rare earth elements and compounds. Volume 14 is primarily concerned with studies involving rare earth intermetallic compounds and is heavily weighted toward physical aspects of these systems.

The first three chapters (93–95) are concerned with recent developments in the use of neutron scattering to probe intermultiplet transitions, NMR methods as they apply to intermetallic compounds, and the use of Raman and Brillouin scattering in such materials. These three contributions are of very high quality, although the relative emphasis on review of published work versus presentation of introductory or explanatory material is variable. The very extensive tabulated NMR data for rare earth intermetallic compounds (40 pages) will no doubt be a valuable reference source for researchers in this field. All three of these chapters emphasize the usefulness and applicability of the experimental technique, as well as the limitations and disadvantages.

Chapters 96 and 97 of this volume are concerned, respectively, with a review of experimental and theoretical aspects of electron–phonon interactions and heavy fermions in rare earth compounds. These two articles clearly represent state-of-the-art reviews and summaries of their respective areas, and each contains several hundred references. Many of the chapters in this volume are prefaced by a useful list of symbols and abbreviations, and this book also contains an index covering all five chapters containing topics and compound formulas.

This volume will be most useful for solid-state experimentalists and theoreticians concerned with intermetallic rare earth compounds and may also serve as a starting point for other researchers interested in applying their expertise to these systems.

James P. Riehl, *University of Missouri—St. Louis*

Phenolic Compounds in Food and Their Effects on Health. I. Analysis, Occurrence, and Chemistry. ACS Symposium Series 506. Edited by Chi-Tang Ho (Rutgers), Chang Y. Lee (Cornell University), and Mou-Tuan Huang (Rutgers). American Chemical Society: Washington, DC. 1992. $74.95. ISBN 0-8412-2475-7.

This book was developed from a symposium sponsored by the Division of Agricultural and Food Chemistry of the ACS at the Fourth Chemical Congress of North America (202nd National Meeting of the ACS) in New York, August 25–30, 1991. After a preface by the editors, it contains 30 chapters organized under the following headings: Perspectives; Analytical Methodology; Selected Occurrence of Phenolic Compounds; Flavor of Phenolic Compounds; Chemical Properties of Phenolic Compounds; and Biochemical Properties of Phenolic Compounds. There are indexes of the authors, their affiliations, and subjects.

Molecular Mechanisms of Insecticide Resistance. Diversity Among Insects. ACS Symposium Series 505. Edited by Christopher A. Mullin (Pennsylvania State University) and Jeffrey G. Scott (Cornell University). American Chemical Society: Washington, DC. 1992. xiv + 322 pp. $74.95. ISBN 0-8412-2474-9.

This book was developed from a symposium sponsored by the Division of Agrochemicals of the ACS at the Fourth Chemical Congress of North America (202nd National Meeting of the ACS) in New York, August 25–30, 1991. After an introduction by the editors, it contains 22 chapters, organized under the following headings: Molecular Basis of Insecticide Resistance in Diptera; Lepidopteran Mechanisms to Resist Toxicants; and Resistance Mechanisms of Other Insect Orders. There are indexes of the authors, their affiliations, and subjects.