

## Additions and Corrections

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### Highly Active Pd(II) PCP-Type Catalysts for the Heck Reaction [J. Am. Chem. Soc. 1997, 119, 11687–11688].

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Page 11688, Table 1: The time/temp column of entry 1 (first row) should read 60/140.

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## Book Reviews

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**Burger's Medicinal Chemistry and Drug Discovery, 5th ed. Vol. 4. Therapeutic Agents.** Edited by Manfred E. Wolff (Technipharma Consultants). Wiley: New York. 1997. vii + 656 pp. \$225.00. ISBN 0-471-57559-3.

Volume 4 in the latest edition of this authoritative medicinal chemistry review contains an extension of the coverage of three topics presented in Volume 2; specifically, cardiovascular drugs, chemotherapeutic agents, and endocrine drugs. Recent developments in the area of radiological agents are also reviewed in the present volume. Twenty six authors associated with a representative cross-section of academic and industrial laboratories contributed to Volume 4.

In fashion similar to previous editions and volumes of *Burger's Medicinal Chemistry and Drug Discovery*, the present work is praiseworthy for several reasons. It certainly fulfills its primary objective in providing current reviews of research on specific types of therapeutic agents. Nine of the thirteen chapters are sufficiently timely, containing literature references through early 1996. Information in the two most-dated chapters on anthelmintic and antiamebic agents is augmented by the inclusion of updates. Most chapters begin with a brief discussion of seminal work in the area under review, including key references that provide a starting place for the uninitiated reader to become familiar with the field. Most chapters follow the much-appreciated convention of interspersing structural formulas with text, which facilitates reading and comprehension. Text and structural formulas are printed in a clear, sharp fashion on acid-free paper. The volume is carefully edited and remarkably free of typographical errors.

Two minor concerns related mainly to style rather than content are noted. The aforementioned updates, in both cases, are short on structural formulas, and not correlated well with their respective chapters. Structural formulas drawn and numbered in the chapters could have been cross referenced by using the same numbers in the updates, for example. The chapter covering chemotherapy of African trypanosomiasis presents all structural formulas in a single table, and it was somewhat annoying to flip back and forth between table and text.

The present volume in *Burger's Medicinal Chemistry and Drug Discovery* belongs on the reference shelf of all libraries serving the medicinal chemistry community. The work in general continues to be a primary source of current information on pharmaceutical research.

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**Materials Crystal Chemistry.** By Relva C. Buchanan and Taeun Park (University of Cincinnati). Marcel Dekker: New York. 1997. vii + 462 pp. \$175.00. ISBN: 0-8247-9798-1.

This book does not easily fit into the normal chemistry curriculum, with some sections at a first year undergraduate level, particularly in the first 133 pages, and other sections at the beginning graduate student level. This is probably at least in part due to its Materials Science Department origin.

The book is very clearly setup in four chapters, starting with the fundamentals of atoms and molecules, then moving to symmetry and crystallography, some simple crystal structures in Chapter 3, and in Chapter 4 discusses structural changes in crystals. The first chapter covers the fundamentals of atoms, molecules and solids starting from the Bohr model, then onto simple quantum mechanics, electron configuration of atoms, shapes of orbitals, electron affinity, ionization potentials, types of bonding, VSEPR, the concept of ionic size (and its dependence on bonding), and finally the extension of these concepts to simple solids.

The second chapter discusses the fundamentals of crystallography, with the major emphasis being placed on symmetry; a very clearly written chapter.

Chapter 3 introduces the structure of crystals beginning with close packing of spheres, extends to polyhedra and concludes with 7 pages on covalent structures such as diamond, graphite, BN, and phosphorus. All the expected ionic structures are covered, and no background beyond general chemistry is necessary to understand this chapter.

The last chapter first discusses the structure changes occurring in materials such as quartz ( $\alpha$ -,  $\beta$ -, including right and left-handed structures), carbon (graphite and diamond), calcium carbonate (calcite and aragonite), titanium dioxide (brookite, anatase and rutile), zirconia, and perovskite, then discusses briefly defects in crystals and concludes with a discussion of the structure of silicates. The last is weak particularly in the description of the layered structures such as vermiculite, where several errors and poor English have crept in. The choice of materials in this chapter are not those a chemist would make, as the role structure plays in chemical reactivity is not discussed, for example while describing the clays (ion exchange or by extending to zeolites) or by comparing the structures and reactivity of  $\text{TiO}_2$  and  $\text{TiS}_2$ . The authors also miss the opportunity to discuss the high ionic diffusivity in stabilized zirconia, and appear to misinterpret the transformation mechanism between the different phases of  $\text{ZrO}_2$ .

The presentation quality of the book overall is fair, with most figures being clear, a rather large number of spelling/typographical errors, and total inconsistency in the way figure captions are presented. In addition, the unevenness in the line-spacing in a few places gives away that the pages were setup on a personal computer, which makes the price of \$175.00 unreasonable and will preclude many from getting a worthwhile book for their own shelves. On the other hand the \$65.00 price for classroom use (minimum 5 copies), is very reasonable, and I can recommend it for courses at the undergraduate or graduate level in structural chemistry or geology. It is readily readable, and the mostly familiar background at the beginning will build the student's confidence quickly.

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**Functional Monomers and Polymers, 2nd ed.** Edited by Kiichi Takemoto (Ryukoku University), Raphael M. Ottenbrite (Virginia Commonwealth University), and Mikiharu Kamachi (Osaka University). Marcel Dekker: New York. 1997. xi + 537 pp. \$175. ISBN 0-8247-9991-7.

The first edition focused on procedures, synthesis, and applications of functional polymers, i.e., polymers with particular practical functions. The second edition updates the earlier book and deals with the chemistry and technology associated with functionalization of monomers and the preparation and processing of polymers to serve specific material needs. After an introductory overview by Takemoto, chapters follow on polymeric catalysts, photoresponsive polymers, electrically conducting polymers, magnetic polymers, oxygen-carrying and oxygen-permeating polymers, polymeric inclusion complexes, biologically active polymers and biomaterials, polymeric materials for nonlinear optical applications, ion-conducting polymers, chitin heparinoids, micelles of functionalized amphiphilic polyelectrolytes and polymer gels. Each chapter is authored or coauthored by either a specialist or a group of specialists in the particular topic covered. Most of the topics in the book have been actively developed and investigated since the 1960s so that the bulk of the references cover the period from 1960 to the mid 1990s. The reader who wishes to be thoroughly up-to-date, however, will need to supplement the book by consulting the current journal literature over the past 2–3 years. The book is important to those in the chemical/polymer science community who wish to obtain an authoritative overview of recent progress (over the past 30–40 years) in the specialized polymer topics that are covered. The book aims to be an indispensable guidebook for researchers and graduate students who are interested in the broad range of functional polymeric materials that are covered. It amply fulfills this objective.

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**Topics in Applied Chemistry: Phosphate Fibers.** By Edward J. Griffith (Monsanto Company). Plenum Press: New York. 1995. xix + 227 pp. \$75.00. ISBN 0-306-45-145-X.

*Phosphate Fibers* (Plenum Press, 1995), by Edward J. Griffith, is an entertaining and detailed book about the industrial research and production of polymers based on inorganic phosphates. Griffith and his colleagues at Monsanto originally conceived the phosphate fibers project to explore the use of these inorganic polymers as replacements for asbestos. It was the fear from the kind of litigation against asbestos suppliers that lead to the eventual downfall of the project.

In the first part of the book, Griffith lays a foundation for a discussion of phosphate fibers. He establishes the critical link between phosphates and life on earth. He discusses the abundance of phosphates in the lithosphere and the hydrosphere and phosphate as the limiting “nutrient” for life. He describes several types of fibers found in nature, including inorganic “asbestos-like” fibers.

Throughout the book, Griffith emphasizes the chemical and physical properties of phosphate fibers that make them industrially and biologically important. [Polyphosphates are ubiquitous in living systems and have functions in energy and phosphate storage, transformation of cells by DNA, and pH buffering, to name a few (see Forward by Arthur Kornberg).] He explains the chemistry of phosphate and physical properties of phosphate polymers in terms simple enough that someone with only cursory knowledge of chemistry and physics could understand, yet in enough detail to capture the salient characteristics of these polymers. Griffith applies general principles of polymer science to polyphosphate chains: control of chain length, terminators of chain polymerization, and influence of chain length on polyphosphate crystallinity. He also discusses the structures of specific polyphosphates, such as Kurrol’s salt and aluminum polyphosphates, polyphosphate solubility and complexation with metal ions, and the influence of electron density on hydrolysis.

Griffith emphasizes the phase behavior of condensed phosphate fibers in several chapters. Griffith establishes an important and understandable theoretical basis for the amorphous content of long-chain phosphates and presents phase diagrams for phosphate fibers, the obvious result of an enormous amount of work. Griffith explains how these phase diagrams are used to direct production of phosphate fibers with the desired properties.

Chapters 6 and 7 may be the most important chapters of the book; it is here that Griffith discusses the experimental approaches to synthesize phosphate fibers and their scale-up from laboratory to production. These chapters are not recipes but rather discussion of the potential problems, failed experiments, and “tricks-of-the-trade”. It would be rare to find such information in the methods sections of scientific journal articles, but could save years of work for the potential “polyphosphatologist”.

Besides the important chemistry and physics of phosphate fibers, Griffith discusses some of the many uses for phosphate and phosphate fibers: food preservatives, detergents, cement pipe, plastic reinforcement, paper, automobile brakes, surgical implants, and even smokeless cigarettes. In his “unbiased” opinion, Griffith believes that phosphate fibers have a bright future, particularly when the composition patents expire. Although the work at Monsanto on phosphate fiber has ended, there appears to be intense interest in these fibers in other countries.

Sprinkled throughout the book are lessons in the practice of politics in an industrial setting. Griffith explains, using examples from the phosphate fibers project, how “to make your boss look good” and how in the end, the fate of a project is not decided by the people who know the project best, namely the scientists and engineers, but by lawyers and corporate bureaucrats.

In summary, *Phosphate Fibers* is an enjoyable and informative book. It is a “must-read” for phosphate chemists and engineers but should also find broad appeal.

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**New Developments in Construction and Functions of Organic Thin Films. Studies in Interface Science, No. 4.** Edited by T. Kajiyama (Kyushu University Japan) and M. Aizawa (Tokyo Institute of Technology, Japan). Elsevier: Amsterdam. 1996. iv + 359 pp. \$265.75. ISBN 0-444-81956-8.

It is not evident from the title that this book is focused mainly on Langmuir–Blodgett (LB) films. It contains a chapter by K. Okuyama and M. Shimomura on the structures of films cast from solutions of azobenzene amphiphiles and one by M. Makino and K. Yoshikawa on the dynamic response to compression of films at the air/water interface, but the other eight chapters are concerned with research on the preparation, properties, and applications of LB films. Self-assembly, an alternative and intensively studied method for preparing organic thin films, is briefly cited once. The contributors are all from Japan, a center of research on LB films, and they have mainly described their work rather than present comprehensive reviews of the topics. Several chapters have the appearance of research papers strung together. There are over 500 references but fewer than 15% are post-1992; these more recent citations contribute significantly only in the chapter by H. Nakahara on the control of orientation and packing in LB films and that by M. Fujihara on photoinduced electron transfer. There is little evidence of editing; typographic errors and misspellings abound in the camera-ready copy, and figures containing electron-microscope or scanning-force-microscopy images are in some places too small to be useful.

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