Functional Monomers and Polymers, 2nd ed. Edited by Kiichi Takemoto (Ryukoko 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 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.

Philip J. Reucroft, *University of Kentucky*

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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.

J. D. Keasling, *University of California—Berkeley*

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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-mucroscopy images are in some places too small to be useful.

Charles M. Knobler, *University of California, Los Angeles*

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