

Book Review

**Well Architected Fluoropolymers: Synthesis, Properties and Applications By Bruno Améduri and Bernard Boutevin (Ecole Nationale Supérieure de Chemie de Montpellier). Elsevier Ltd: Oxford. 2004. xviii + 481 pp. \$189.00. ISBN 0-08-044388-5.**

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**Progress in Colloid and Polymer Science, Volume 125: From Colloids to Nanotechnology.** Edited by Miklós Zrínyi and Zoltán Hórvölgyi (Budapest University of Technology and Economics). Springer-Verlag: Berlin, Heidelberg, 2004. viii + 226 pp. \$189.00 ISBN 3-540-40658-1.

This book contains a number of papers presented at the 8th Conference on Colloid Chemistry hosted by the Hungarian Chemical Society and organized by the Budapest University of Technology and Economics in Keszthely, Hungary, in September 2002. Its 36 chapters are organized under the following broad topics: Advanced Materials; Nanoparticles, Nanostructures and Nanocomposites; Interfaces, Adsorption; Polymers and Macromolecular Solutions; Surfactants; and Aggregation and Growth. An online version is also available.

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**Reviews in Computational Chemistry, Volume 20.** Edited by Kenny B. Lipkowitz (North Dakota State University), Raima Larter (Indiana University-Purdue University), Thomas R. Cundari (University of North Texas), and Donald B. Boyd, Editor Emeritus (Indiana University-Purdue University). John Wiley & Sons, Inc.: Hoboken, NJ, 2004. xxvi + 458 pp. \$150.00. ISBN 0-471-44525-8.

The field of theoretical and computational chemistry is an actively growing area of science being employed by both experts and nonexperts to enhance their research. This will only continue as more powerful computers and new algorithms are developed. Concomitantly, there has been a growing number of books dedicated to this area. However, these generally focus on one area of this broad field and are either very general for the beginner, providing little for the expert practitioner, or quite technical and thus of little assistance to the beginner.

In contrast, this latest volume in the well-known and established series *Reviews in Computational Chemistry* continues the tradition of providing, within one book, chapters on topics across the breadth of theoretical and computational chemistry. Furthermore, they continue to be written by well-known authors in their respective fields and, to the ongoing credit of the series, in a manner that is accessible to all readers, regardless of their level of expertise.

For example, in this latest volume, the topics range from valence bond theory to the modeling of spin-forbidden reactions and calculation of the spectra of large molecules, to chemical waves and patterns, fuzzy soft-computing methods, and large-scale modeling of proteins. Each chapter begins with a general introduction of the topic and then, with the aim of being as *instructional* as possible, highlights various issues of relevance to anyone interested in the topic. This modular-like approach allows the reader to zero in easily on a particular topic of interest within a given area and serves to enhance the reference booklike

qualities of the series. A notable and welcome feature of all the chapters is the use of examples and case studies, thus providing the often much-needed and appreciated connection between a theory or concept and its practical application. This feature only helps to enhance the utility and readability of each chapter and thereby increases the book's appeal to as broad an audience as possible. Finally, the references given within each chapter are generally extensive and as up-to-date (2002) as can be expected for a book chapter.

Overall, this volume continues the traditions and standards of this series as a prime resource for anyone with an interest in theoretical and computational chemistry. While the cost of each individual volume precludes most users from building their own complete and ongoing collection, this volume would be a welcome addition to any library collection.

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**Well Architected Fluoropolymers: Synthesis, Properties and Applications.** By Bruno Améduri and Bernard Boutevin (Ecole Nationale Supérieure de Chimie de Montpellier). Elsevier Ltd: Oxford, 2004. xviii + 481 pp. \$189.00. ISBN 0-08-044388-5.

This most recent book on fluoropolymers is composed of only five chapters, which are organized in minute and helpful detail. The references for each are thorough and numerous, varying from 162 to 422 per chapter with a total of 1739 for the book. This extremely impressive compilation of data and references makes this book a most valuable resource on this topic.

Each chapter is organized into subsections with a detailed table of contents, which helps the reader to find and understand how the topics are related. There are numerous tables and schemes that give a clear summary of the issues for each subtopic. A complete list of acronyms is provided, which is very helpful, especially when numerous commercial materials are available. However, a single table of the names of commercial materials, their composition, properties, and applications would have given the book further value. Finally, for each chapter, and even for each subsection, there is an informative conclusion, another helpful feature.

Chapter 1 gives a good introduction to telomerization and is descriptive and instructive for the novice. There are here, as in all chapters, complete tables (28 in this chapter alone) showing reaction types as well as discussions of kinetics, transfer constants, and initiator types.

The second chapter is on the synthesis of fluorinated telechelics, which is addressed as backbone or side group systems from various starting platforms, including diols, diamines, nonconjugated dienes, etc. Again, both industrial and noncommercial materials are included in the discussion. An excellent chart of derivatives from  $\alpha,\omega$ -diiodofluoroalkanes is

given. Although much of this book is concerned with chain-growth (addition) polymers, some step-growth (condensation) systems are presented in this chapter.

Fluorinated, alternating addition copolymers are discussed in Chapter 3. Among the thorough and helpful tables in this chapter are two of special note: one of fluoroolefins with their  $e$  and  $Q$  values and another of copolymer reactivity ratios involving tetrafluoroethylene (TFE). A list of donor/acceptor monomers is included with a discussion of charge-transfer complexes.

The syntheses, properties, and applications of di-, tri-, and multiblock systems are the topics of Chapter 4. It contains useful tables of synthetic methods and applications vs properties.

The final chapter covers synthesis, properties, and applications of fluorinated graft copolymers, for example, epoxides and oxetanes with TFE units. Modifications of siloxane, phenylene, and phosphazene polymers, among others, are also presented. Numerous methods to produce these systems are described, and comprehensive reaction schemes are included. There are several tables: one showing grafting reactants, experimental conditions, properties, and applications, and others of grafted systems (PTFE, PVDF, PFA, ETFE, FEP, etc.) with methods, properties, and applications.

In conclusion, this thorough, detailed, and extremely well-referenced book with a focus on chain-growth backbones is a welcome and much-needed reference work. Perhaps the authors would consider a similar text on step-growth fluoropolymers.

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**Name Reactions in Heterocyclic Chemistry.** Edited by Jie-Jack Li (Pfizer Global Research and Development). Scientific Editor: E. J. Corey (Harvard University). John Wiley & Sons, Inc.: Hoboken, NJ. 2005. xx + 558 pp. \$125.00. ISBN 0-471-30215-5.

Described as a “one-step repository for name reactions in heterochemistry”, this book covers reactions for three-, four-, five-, and six-membered heterocycles. Information for each name reaction is given in seven sections: Description, Historical Perspective, Mechanism, Variations and Improvements, Synthetic Utility, Experimental, and References. The contributing authors come from both academia and industry and are all intimately familiar with the reactions they describe; some can even lay claim to discovering the reactions that they write about. A list of acronyms and abbreviations introduces the book, and a subject index concludes it.

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**DNA-Based Molecular Electronics. International Symposium on DNA-Based Molecular Electronics, Jena, Germany, May 13–15, 2004. AIP Conference Proceeding, Volume 725.** Edited by Wolfgang Fritzsche (IPHT, Jena, Germany). American Institute of Physics: Melville, NY. 2004. x + 116 pp. \$98.00. ISBN 0-7354-0206-X.

This symposium proceeding contains 11 chapters, organized under the following headings: Control of DNA Positioning; DNA Derivatization; DNA Superstructures; and Dielectrophoretic Manipulation. Among other items, it also includes several appendices, symposium notes, and an author index.

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