

Book Reviews *

Advances in Carbocation Chemistry, Volume 2. Edited by James M. Coxon (University of Canterbury). JAI: Greenwich, U.K. 1995. ix + 273 pp. \$97.50. ISBN 0-89232-952-1.

The monograph is the second volume in the series *Advances in Carbocation Chemistry* (Volume 1, 1985, was edited by Xavier Creary). It consists of six chapters.

Following a short preface by the editor, the first chapter (by Angel and Mattson-Arnaiz) deals with intramolecular cyclizations via benzylic cations. After a brief review of benzyl carbocations, the chapter is divided into two parts dealing with six-membered and five-membered ring formation. A good number of examples are gathered for each type. This chapter is a nice illustration of utility of carbocations formed in strong acids in synthesis, including natural products, and complements the chapter by Charpentier-Morize and Bonet-Delpon in Volume 1 in this series on utility of "destabilized carbocations" in synthetic chemistry.

The second chapter (by Kelly) provides an up-to-date account on application of one-bond C-H NMR coupling in a host of persistent carbocations generated in superacids (acyclic, monocyclic, bicyclic, polycyclic, nonclassical, and aromatic) to derive structural/conformational information. This chapter is quite comprehensive and provides a valuable compilation of key NMR features on long-lived carbocations from the recent literature.

The third chapter (by Della and Schiesser) provides a discussion of strained bridgehead cyclobutyl carbocations including cubyl cations under solvolytic conditions. A good discussion of high-level ab initio calculational studies on these ions is also provided.

The fourth chapter (by Sorenson) provides an authoritative review of persistent tertiary carbocations in superacids emphasizing their dynamic NMR features and potential energy surfaces; X-ray structural data and theoretical studies are incorporated. The chapter does a great job of demonstrating that the potential energy surfaces of "classical" cations can be quite flat.

The fifth chapter (by Dietze) deals with solvolysis of simple secondary carbon substrates and discusses their mechanism and reaction coordinates.

The sixth and last chapter (by Ebersson, Hartshorn, and Radner) provides a detailed discussion of electrophilic aromatic nitration reactions, where possible involvement of radical cations as distinct intermediates are critically examined. Application of Marcus theory, detection of radical cations under nitration conditions, formation of oxidative substitution products, and photonitrations are discussed.

Overall, this volume of *Advances in Carbocation Chemistry* is a welcome addition to the literature on modern carbocation chemistry; it is highly recommended as a useful review source to the physical organic chemistry community.

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Nylon Plastics Handbook. Edited by Melvin I. Kohan (MIK Associates). Hanser: Cincinnati, OH. 1995. xii + 631 pp. \$198.00. ISBN 1-56990-189-9.

The objective of this book is to review the science and technology of nylon plastics. Forty-three scientists representing companies, research institutes, and universities worldwide contributed to the text which is divided into 13 chapters. From a historical perspective the book is well-referenced. Chapters 11-13 contain the most current references, several from 1994. These chapters cover current modifica-

tion procedures and secondary treatments to produce commercial plastics. In addition the applications of current commercial plastics are reviewed by the manufacturers.

The first chapter includes a short lesson on nomenclature and then a short history of nylon plastics. The second chapter discusses the various methods of polymerization available in the preparation of polyamides, while the third chapter discusses the chemistry of the polymerization reaction from the kinetics to the molecular mass distribution. The characterization of nylon plastics has changed greatly over the past years. The use of infrared, Raman and nuclear magnetic resonance spectroscopies, and X-ray diffraction are reviewed in Chapter 4. Physical structure, transitions, and relaxation of polyamides are covered in Chapters 5 and 6. The fundamental techniques of melt processing are presented in Chapters 7 and 8. Chapter 9 covers powder coating, blending, and solution casting techniques. The mechanical, thermal, electrical, and optical properties of nylons are discussed in Chapter 10. Nylons have the capacity for modifications based on molecular mass, copolymerization, mineral fillers, fibrous reinforcement, plasticizers, fire retardants, and others. These modifications and the resulting plastics are presented in Chapter 11. Secondary treatments of nylon plastics such as annealing, machining, and surface coloring are presented in Chapter 12. A review of commercial nylon plastics and their applications are presented in Chapter 13.

This book is clearly written, and even though it is a handbook, it is very readable. It is suitable reading for an upper-level undergraduate or beginning graduate student who may be interested in polymer chemistry, nylon plastics in particular. It provides a complete review of nylon plastics for the scientist in academia or industry who is interested in the chemistry, characterization, or properties of the nylon plastics.

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Plastics, Rubber, and Paper Recycling: A Pragmatic Approach.

Edited by Charles P. Rader (Advanced Elastomer Systems, L.P.), Sheryl D. Baldwin (Phillip Morris Research Center), David D. Cornell (Eastman Chemical Co.), George D. Sadler, (Illinois Institute of Technology), and Richard F. Stockel (Tosoh, USA). ACS: Washington, DC. 1995. x + 532 pp. \$119.95. ISBN 0-8412-3325-X.

This book is number 609 in the American Chemical Society Symposium Series. It was developed from a symposium sponsored by the Division of Polymer Chemistry, Inc.; Polymer Materials: Science and Engineering, Inc.; Cellulose, Paper and Textile Chemistry; Agricultural and Food Chemistry; Environmental Chemistry, Inc.; Business Development and Management; Rubber, Inc.; and the Macromolecular Secretariat at the 208th National Meeting of the American Chemical Society, Washington, DC, August 21-25, 1994. This volume presents an up-to-date analysis of the current technology for recycling paper, rubber, and plastics used in food packaging, automotive parts, and many other applications. The need for recycling polymeric materials is examined, as well as the practical limits, logistics, and economic aspects of polymer recycling. The special requirements for recycling polymers to produce products that have contact with food is explored.

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*Unsigned book reviews are by the Book Review Editor.