

Organic Reactions, Volume 63. Editor-in-Chief: Larry E. Overman (University of California, Irvine). John Wiley & Sons, Inc.: Hoboken. 2004. vii + 584 pp. \$125.00. ISBN: 0-471-44532-0.

The principle behind *Organic Reactions* is to publish a collection of chapters that are “each devoted to a single reaction, or a definite phase of a reaction, of wide applicability”, to quote from the preface. The three chapters of this volume are (1) “The Biginelli Dihydropyrimidine Synthesis” by Kappe and Stadler, (2) “Microbial Arene Oxidations” by Johnson, and (3) “Cu, Ni, and Pd Mediated Homocoupling Reactions in Biaryl Synthesis: The Ullmann Reaction” by Nelson and Crouch. These are followed by cumulative chapter titles by volume, an author index of volumes 1–63, and a chapter and topic index of volumes 1–63.

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Differential Scanning Calorimetry, Second Edition. By G. W. Höhne (Retired from the Universität Ulm), W. F. Hemminger (Physikalisch-Technische Bundesanstalt), and H.-J. Flammersheim (Universität Jena). Springer Verlag: Berlin, Heidelberg, New York. 2003. xii + 298 pp. \$149.00. ISBN 3-540-00467-X.

One common misconception about differential scanning calorimetry (DSC) is that anyone can do it with only minimal training. Another is that DSC data are only qualitative and of limited use. This book illustrates the science of DSC, which must be understood by anyone who wants to do calorimetry, and attests to the fact that qualitative DSC is not an inherent property. The perception that DSC affords only *qualitative* data results from ignorance of the knowledge amassed by experts in the field. The fact is that done properly, and with the necessary calibrations, no more time is required for obtaining valuable, quantitative DSC traces than for qualitative traces. In this book, Höhne, Hemminger, and Flammersheim, authorities in the field, provide the needed theoretical background to broaden our understanding of quantitative DSC.

A brief introduction gives the objective of the book, the needed basic definitions and standards, and concludes with a list of present-day applications. All are documented with selected references. In the following five chapters, discussions are given of the types of differential scanning calorimeters and their modes of operation, the theoretical fundamentals, calibration, evaluating curves, and applications. The book closes with a scheme and checklist for evaluating the performance of a differential scanning calorimeter, a unique feature that allows one to find out if a given calorimeter is capable of addressing the task on hand. Two appendices provide a comparison of differential thermal analysis and differential scanning calorimetry and a

synopsis of calorimetry in general. Almost 500 references and a subject index round out the book.

The calorimeters are subdivided, as usual, into heat flux and power-compensating DSCs, with some, but not all, of the special variations of these described. A conscious effort has been made to schematize the instruments to a degree that eliminates direct reference to the manufacturer. This removes commercial bias, but makes it hard for the novice to identify the specific application to his or her particular instrument or to locate where a particular instrument could be purchased, a point that should be recognized since self-built calorimeters are all but nonexistent, and most instruments come from three to five manufacturers. Naturally, it is difficult to cover all available instruments, but a list that correlates the schematics with particular instruments would have been valuable.

Modern temperature-modulated differential scanning calorimetry (TMDSC) was brought about by the possibility of simultaneously deconvoluting a standard DSC signal (total signal) from the reversing signal arising from temperature modulation. A description of this method and the possibility to derive complex heat capacities are the major updates to this edition. It is unfortunate that the history of TMDSC is misinterpreted by the authors because of their reference to a paper by Gobrecht et al. Deconvolution of the total signal was never accomplished in the research described in this work, and only the possibility to derive complex heat capacities was illustrated; this was already known from AC calorimetry and was documented in a study of slowly responding degrees of freedom of gases. In the long run, this point is probably of little importance because nowadays the total signal seems to be better obtained by either separate runs on the same sample or by specially designed modulation programs consisting of multiple frequencies and fixed amplitudes that yield sufficiently long linear components to permit extraction of the standard DSC signal by proper parsing, but without deconvolution.

As much as possible, aspects of DSC are distilled into mathematical expressions that range from easy-to-apply first approximations and calibration equations to the evaluation of equivalent electric circuit diagrams so as to grasp the problem of thermal lag. For the novice, this part of the theory may look forbidding, but can easily be reserved for later, more detailed study since even the highest approximation does not solve the problem, and the more advanced, computerized differential scanning calorimeter makes these corrections online during the measurement and substantially reduces, but does not eliminate, the remaining empirical calibrations.

The chapters on calibration and evaluation of curves are a must for every practitioner of DSC. These topics are essential to graduating from qualitative to quantitative measurements, and the authors do a superb job in providing the necessary information along with the tables of standards needed.

The chapter on applications covers topics such as the measurement of heat capacity and latent heats, the basic calorimetric techniques, and kinetics, the special domain of DSC.

These basic fields are followed by a number of the special topics, such as the glass transition and physical aging, applications to biology, food science, pharmaceuticals, measurements of porosity, and evaluation of hazards and purity. Overall, this chapter gives a broad picture of DSC.

To summarize, the second edition of *Differential Scanning Calorimetry* is presently the most up-to-date and detailed book for learning about the quantitative DSC at the top level of the field. A copy of it should reside next to every differential scanning calorimeter to serve as a reference for providing authoritative answers to many of the questions that may arise when using DSC. The book should also be useful as a study guide and text for a student or operator who wants to become an expert in the field. For a small investment, it will pay large dividends when used frequently.

Bernhard Wunderlich, *The University of Tennessee, Knoxville*

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Advances in Heterocyclic Chemistry, Volume 84.

Edited by Alan R. Katritzky (University of Florida, Gainesville). Academic Press (an imprint of Elsevier): San Diego, CA. 2003. x + 354 pp. \$152.00. ISBN: 0-12-020784-2.

The 84th volume of *Advances in Heterocyclic Chemistry* is composed of five chapters dealing with various topics in heterocyclic chemistry, and as would be expected, the value of its contents is dependent on a reader's specific interests. Overall, the chapters differ in their scope, ranging from very specialized topics to more general ones.

The volume opens with a chapter entitled, "Palladium in Quinoline Synthesis". The recent book by Li and Gribble, "Palladium in Heterocyclic Chemistry", did not cover this class of heterocycles, and thus coverage of it is welcome, although the chapter would have benefited from inclusion of more mechanistic discussion and elimination of aspects of the chemistry of quinoline that should already be known by readers who presumably are working with them. Unfortunately, this is probably the weakest chapter in the book. The chapter would have benefited considerably from more careful editing.

The chapter "Pyrimidine-Pyridine Ring Interconversion" addresses a topic on which there have been no reviews for some time. It is interesting and well-organized and contains lucid explanations of the reactions that are considered. It represents a very professional job on a topic of general interest and is possibly the best chapter in the book.

The following chapter, "Fused Heterocyclo-Quinolines Containing One Nitrogen Atom at Ring Junction: Part 1. Four and Five Membered Heterocyclo-Quinolines", covers a very narrow subject that will appeal only to a specialized audience. This chapter could also have benefited from editorial control, as the structures lack uniformity and could have been better drawn.

"Organometallic Compounds of Chalcogenoazoles and their Benzannulated Derivatives" is a very interesting and well-written chapter on a topic of general interest. The title is somewhat misleading because, in addition to coverage of systems containing only nitrogen, the discussion encompasses examples with only oxygen, sulfur, and selenium, with only minimal coverage of the latter. Nevertheless, it is a useful addition to organometallic chemistry as it relates to heterocyclic chemistry.

The volume concludes with a chapter entitled, "Recent Development in the Chemistry of Pyrido-oxazines, Pyrido-thiazines, Pyrido-diazines and their Benzologs: Part 1". It is a useful, well-organized review of recent developments in this area. Relevant mechanistic explanations are provided, and the numerous structures contained in the chapter are generally well-executed. Medicinal applications of these classes of compounds are noted, and the bibliography is extensive.

While this volume and the series containing it are useful to heterocyclic chemists, I believe that the quality of this series has been declining. The value of this contribution would have been enhanced if the chapters were more uniform, not only in quality, but also in format. The level of quality can be addressed by stronger editorial oversight and more careful proofreading by the authors and editor. The omnipresence of computers and the software available to them makes it difficult to understand why there should be so many typographical errors and a lack of commonality in the size of chemical structures and fonts used throughout the various chapters. Moreover, earlier volumes in this series had indices, and the absence of them in this instance is regrettable. The lack of a subject index is a particularly significant shortcoming in a specialized book such as this because finding specific schemes or discussions is difficult without it. The cumulative index of the series does not substitute for this important function. Again, the availability of appropriate software makes compiling an index much less burdensome than in the past. Considering the price of the book, more care in its production would have been appropriate. I believe this series will attract fewer buyers unless the producers decide to change their philosophy so as to produce a more carefully crafted product.

Madeleine M. Joullié, *University of Pennsylvania*

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