

**New Carbon Based Materials for Electrochemical Energy Storage Systems.** Edited by Igor V. Barsukov (Superior Graphite Co., Chicago, IL), Christopher S. Johnson (Argonne National Lab., Argonne, IL), Joseph E. Doniger (Dontech Global, Inc., Lake Forest, IL) Vyacheslav Z. Barsukov (Kiev National University of Technology and Design, Kiev, Ukraine). Springer: Dordrecht. 2006. xxiv + 524 pp. \$89.95. ISBN 1-4020-4810-6.

The book was developed from the lectures given at the NATO–Carbon Advanced Research Workshop and Conference held in Argonne, IL in October, 2003. There are 41 papers grouped under the following six chapters: (1) New Carbon Materials for Supercapacitors; (2) Carbon Materials for Gas Diffusion Electrodes, Metal Air Cells and Batteries; (3) Carbon Anodes for Lithium-Ion Batteries; (4) Emerging Metal/Carbon Composite Anodes for Next Generation Lithium-Ion Batteries; (5) New Nano-Through Macro-Carbons for Energy Systems: Synthesis, Modeling, Characterization; and (6) Carbons in the Cathodes of Lithium-Ion Batteries; Alternative Forms of MnO<sub>2</sub> Cathode/Carbon Modeling. A subject index completes the book.

JA0697931

10.1021/ja0697931

**Advances in Chemical Physics, Volume 133. Fractals, Diffusion, and Relaxation in Disordered Complex Systems, Parts A–B.** Edited by Yuri P. Kalmykov (Université de Perpignan, France) and William T. Coffey (Trinity College, Dublin, Ireland). Series Edited by Stuart A. Rice. J. Wiley & Sons, Inc.: Hoboken, NJ. 2006. xxii + 570 pp (for A) and xxii + 728 pp (for B). \$295 for set. ISBN 0-470-04607-4 for set.

This special, guest-edited, two-part volume of *Advances in Chemical Physics* consists of four experimental and seven theoretical chapters on the subject of fractals, diffusion, and relaxation in disordered complex systems. Some of the chapters featured here include “Dielectric Relaxation Phenomena in Complex Materials”, “Power-Law Blinking Quantum Dots: Stochastic and Physical Models”; “Fractal Physiology, Complexity and the Fractional Calculus”; and “Molecular Dynamics in Thin Polymer Films”, to name a few. Each volume concludes with an author and a subject index.

JA069796D

10.1021/ja069796d

**Handbook of Laser-Induced Breakdown Spectroscopy.** By David A. Cremers (Applied Research Associates, Inc., Albuquerque, NM) and Leon J. Radziemski (Research Corporation, Tucson, AZ). John Wiley & Sons, Ltd.: Chichester. 2006. xviii + 284 pp. \$145.00. ISBN 0-470-09299-8.

This book was written for both the beginning and experienced user of laser-induced breakdown spectroscopy (LIBS). The aim of the authors was to provide a “comprehensive update of the forefront of LIBS development and applications” as well as a review of “the principles of plasma spectroscopy and analytical spectrochemistry as it applies to LIBS”. The authors cover the history of LIBS and speculate about its future. They also discuss the “fundamental concepts of spectroscopic chemical analysis” in relation to LIBS and provide details about its instrumentation, methods, and applications, including comments about its advantages and limitations. The book concludes with four appendices and an index: (A) Safety Consideration in LIBS; (B) Recommended Methods for Commencing LIBS Research on a Variety of Samples; (C) Representative LIBS Detection Limits; and (D) Major LIBS References.

JA069799Q

10.1021/ja069799q

**Microwave-Assisted Synthesis of Heterocycles. Topics in Heterocyclic Chemistry, 01.** Edited by Erik Van der Eycken (K. U. Leuven, Heverlee, Belgium) and C. Oliver Kappe (Karl-Franzens University, Graz, Austria). Series Edited by R. R. Gupta. Springer: Berlin, Heidelberg, New York. 2006. xiv + 310 pp. \$149. ISBN: 3-540-30983-7.

This book is Volume I of a new series by Springer entitled *Topics in Heterocyclic Chemistry*. At present, there are six such monographs in this series, the overall scope of which is to cover “current trends in heterocyclic chemistry”. Given the importance of heterocyclic natural products and heterocyclic scaffolds in the realm of medicinal chemistry and drug discovery, an up-to-date series on this subject is well warranted, and a survey of the recent impact of microwave-assisted synthesis on this venerable field is both timely and needed. The application of microwave irradiation to organic reactions has just witnessed its twentieth anniversary, and the routine utilization of dedicated and reproducible monomode instruments is an even more recent phenomenon. Thus, microwave-assisted heterocyclic chemistry is still a relatively immature field but one of unbounded potential.

One chapter is a survey of the ability of microwave irradiation to expedite many of the traditional methods for the construction of heterocyclic systems that invariably involve time-consuming cyclocondensations or cycloadditions. It is presented in an organized fashion according to the class of heterocycle formed. As in most chapters in this monograph, the authors endeavor to select reactions that have been performed under controlled microwave irradiation using a dedicated instrument. Because the alternative to such condensation-type approaches often involves the use of transition-metal-mediated cyclizations, it is fitting that another chapter is devoted to the use of metals for the construction and functionalization of heterocycles.

The pivotal role of heterocycles as privileged scaffolds for drug discovery has expectedly propelled much effort in the preparation of combinatorial libraries of such compounds, often producing a bottleneck due to the lengthy reaction times frequently required for solid-phase processes. The chapter on solid-phase methods for the microwave-assisted synthesis of heterocycles provides a concise but thorough introduction to the field of combinatorial chemistry, descriptions of solid supports, and an excellent survey of the microwave instrumentation and reactors employed for solid-phase organic synthesis (SPOS). The author then goes on to detail the types of heterocyclic compounds prepared by such means and to provide brief but informative surveys of microwave-assisted syntheses on soluble polymer supports as well as in ionic liquid supports and those involving SPOT and fluorous methods. The following chapter offers complementary coverage of microwave-assisted synthesis of heterocycles using polymer-supported reagents, highlighting whenever possible the differences in behavior when compared to the same reactions performed with conventional heating. The decision of the authors to focus on the use of monomode microwave systems and on reactions run in the presence of solvents and involving polymer-supported reagents, catalysts, and scavengers consequently omits a substantial body of work under solventless conditions with the reagents impregnated on various supports. However, such areas have been the subject of numerous reviews and interested readers can be directed there. Another area of intense current interest involves

the use of microwaves to accelerate multicomponent condensations, and this subject is described, with particular emphasis on the introduction of structural diversity.

Additional chapters are dedicated to sulfur- and nitrogen-containing heterocycles and to the microwave-assisted chemistry of specific classes of heterocyclic systems, such as 2-pyridones and 2-pyrazinones. Although these chapters are necessarily of somewhat more narrow focus than the other topics presented in this volume, they are uniformly well presented and instructive and would be of value to anyone interested in the general area of microwave-assisted synthesis. Overall, this is a well thought-out, up-to-date, and informative text written by the many of the leaders in this emerging field. While the editors and authors have done an admirable job of presenting a snapshot of the current state of microwave-assisted heterocyclic chemistry, they have also exposed the fact that much remains to be done in this area, a feat that may be accomplished when this powerful technique has achieved greater acceptance. Finally, although the publication of this volume coincides with the introduction of several excellent monographs on microwave chemistry to the market, the value of the present text is not diminished by these more comprehensive surveys of the topic, in which the coverage of heterocycles is typically limited to a single chapter.

**Daniel M. Ketcha**, *Wright State University*

JA0697626

10.1021/ja0697626