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BOOK REVIEWS

Progress in the Chemistry of Organic Natural Products. Vol. 81. Edited by W. Herz (Florida State University), H. Falk (Johannes-Kepler-Universität), G. W. Kirby (University of Glasgow), and R. E. Moore (University of Hawaii). Featuring the Title: *New Results on the Chemistry of Lichen Substances.* by Siegfried Huneck (Langenbogen/Saalkreis, Germany). Springer-Verlag: Wien and New York. 2001. viii + 314 pp. $179.00. ISBN 3-211-83518-0.

The symbiotic associations of fungi and algae known as lichens produce many unusual secondary compounds found nowhere else in nature. Progress in understanding the structures of a large variety of acetyl-polymalonyl-derived aliphatic and aromatic compounds, mevalonic acid-derived terpenoids, and shikimic acid-derived pigments has been impressive in view of the serious difficulties faced by the phytochemist searching for botanically identified collections freed of co-occurring, often similar-looking but different, species. Nevertheless, the age-old use of lichens in Chinese medicine, the preponderance of unique chemical structures, and the ease with which most lichen secondary products can be extracted have motivated research to such an extent that today new studies cannot be undertaken without a significant understanding of previously published results. To that end, this new work by Siegfreid Huneck is an important contribution, because it updates his milestone 1994 book, coauthored with Isao Yoshimura and too modestly entitled *Identification of Lichen Compounds* (Springer-Verlag: Berlin, Heidelberg, and New York. 1994. xi + 493pp. ISBN 3-540-60811-7).

This book, which has 765 literature references that emphasize in particular the latter years of the two decades from 1980 to 2000, summarizes recent progress in all fields of lichen chemistry and highlights the application of modern chemical methodologies to proofs of structures and synthesis. It is well-illustrated and wide in scope, treating the secondary products from natural lichens as well as those from in vitro cultures of the notoriously slow-growing fungal component of the lichen symbiosis. This book covers many newly discovered substances and provides revised structures for others shown by recent study. It is consequently an essential adjunct to the *Identification of Lichen Compounds* for all libraries serving workers interested in natural-product chemistry.

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NMR Imaging of Materials. By Bernhard Blümich (Rheinisch-Westfalische Technische Hochschule). Oxford University Press: Oxford. 2000. xxiv + 542 pp. $120.00. ISBN 0-19-850683-X.

This book is a welcome addition to the literature. There are relatively few books directed to NMR imaging and fewer still to applications for materials. The subject is broader than medical imaging in that the physical states of the observed materials have greater variety, and even the arrangement of the aggregate can profoundly affect the observed behavior. Appreciation of imaging of materials not only requires understanding of the basics of nuclear magnetic resonance but also requires consideration of a number of physical effects beyond those that figure so prominently in typical applications of high-resolution NMR.

The book, which originated from the author's lecture notes, was designed to appeal to the author's graduate students, who came with a variety of academic backgrounds. Broad in nature, this book deals to some extent with most aspects associated with imaging of materials and explores both classical and quantum mechanical approaches. It also introduces the reader to the fundamentals of NMR theory and hardware and discusses wide-line and high-resolution NMR before broaching the subject of methods of spatial resolution. Basic imaging methods as applicable to liquids and soft matter and solid-state imaging are also covered. The book concludes with a chapter on applications.

The subjects are not so much *developed* as *presented*. The focus is on the *image*, and the use of measurements to characterize properties of materials is given little attention. Consequently, this book may not prove useful to others as a graduate text, even if they share the challenge of preparing students of different backgrounds for research in nonmedical imaging applications. Still, it provides an excellent overall perspective for the field of NMR imaging in materials, and it should serve as a valuable reference for students and practitioners who are looking for overviews and references for specific topics within that field.

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Electrochemical Sensors in Bioanalysis. By Raluca-Ioana Stefan and Jacobus Frederick Van Staden (University of Pretoria, Pretoria, South Africa) and Hassan Y. Aboul-Enein (King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia). Marcel Dekker Inc: New York and Basel. 2001. xxii + 288 pp. $150.00. ISBN 0-8247-0662-5

The authors present a book aimed at reviewing recent developments in electrochemical sensor technology, with emphasis on bioanalysis. Electrochemical sensors have always played a prominent role in bioanalysis, particularly in clinical and patient self-care applications in which portable instrumentation and immediate answers are especially important. The particular advantages of electrochemical measurement strategies, combined with the growing need for improved chemical

measurements in medicine and health-care-related fields, continue to spur further development of electrochemical sensors in bioanalysis. Thus, the book topic is timely.

A quick inspection reveals that the book is divided into 15 chapters, each focused on some aspect of electrochemical sensors in bioanalysis. Though the authors do not say so explicitly, it is assumed that readers already possess a base level of knowledge of electrochemistry, including familiarity with the operation of simple amperometric and potentiometric cells and devices. Thus, the book is probably not a good choice for a newcomer to the field looking for an overview of electrochemical sensors in bioanalysis, but rather, it is targeted at the practitioner looking for an up-to-date summary of recent progress in the field.

The book includes chapters that address a broad range of important topics in electrochemical sensors in bioanalysis. The first four and the last two chapters deal with global issues, such as sensor response factors, validation, uncertainty, and analytical methods. Most of the other chapters are addressed at specific application areas in the field. Some representative chapter topics include inorganic species (e.g., pH, metal ions, gases), small organic molecules (e.g., drugs, biomolecules), DNA and HIV, enantioselective sensors, microbial sensors, sensor arrays, and flow systems. Some of the chapters are relatively short (6 of the 15 chapters are less than seven pages in length), but all of them present recent work in their particular target area. Two chapters stood out to this reviewer as being particularly useful. Those were the chapters on enantioselective sensors and sensors in flow systems. It is perhaps not a coincidence that both of these chapters covered primarily work by the three principal authors of the book. The chapter on small organic molecule sensors is notable for its breadth of coverage, that is, it includes subsections on no fewer than 122 individual analyte molecules and classes, from acetate to xanthine.

In summary, this book presents a timely overview of recent developments in electrochemical sensor technology in bioanalysis. It catalogs many recent applications in this field and presents experimental details that will be useful to the specialist. The presentation is of high quality, and the references are up-to-date (most date from later than 1995.) Generalists looking for a good introduction to the title field would probably do well to consider other books to cover the basics of electrochemical sensor technology prior to trying to read this book. Specialists working on electrochemical sensor technology and libraries serving such people will probably find the book to be a useful addition to their collection.

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