Book Reviews *

Sax's Dangerous Properties of Industrial Materials, 10th Edition. Volumes 1−3. By Richard J. Lewis, Sr. Wiley-Interscience: New York. 2000. 4770 pp. $545.00. ISBN 0-471-35407-4

This very handy reference guide provides health and safety data, regulatory standards, toxicity and carcinogenicity information, and physical property profiles for over 23 000 potentially hazardous chemical substances used in the workplace. A typical entry provides the following information about the target chemical: a three-letter/three-number entry code that is used in all the cross-indexes, a list of synonyms, a hazard rating and DOT code, the CAS Registry Number of the chemical (a complete CAS cross-index is also provided in Volume 1, Section 2), its molecular formula and weight, toxicity data with references, consensus reports, governmental standards and safety recommendations by expert groups, safety profiles, and references to OSHA and NIOSH occupational analytical methods.

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Annual Reports on NMR Spectroscopy. Volume 41. Edited by G. A. Webb (University of Surrey). Academic Press: San Diego, San Francisco, New York, Boston, London, Sydney, Tokyo. 2000. x + 322 pp. $134.95. ISBN 0-12-505341-X

Annual Reports on NMR Spectroscopy, Volume 41, under the able editorship of Graham A. Webb, continues in the series' tradition of presenting an eclectic and timely collection of reviews on recent advances and hot topics in nuclear magnetic resonance spectroscopy. This volume begins with an exhaustive discussion of solid-state ^{59}Co NMR spectroscopy, by J. C. C. Chan and S. C. F. Au-Yeung. Solid-state ^{59}Co NMR data for over 100 compounds are neatly organized in a table with entries that follow the conventions proposed by a group of NMR spectroscopists in a meeting at the University of Maryland in 1992. Hence, the data presented in this section not only would attract those who are experimentally measuring ^{59}Co NMR chemical shift tensors, but also those who are actively pursuing and perfecting the theory of NMR chemical shift calculations. The ^{59}Co nucleus certainly offers a unique and stringent test arena for post-Hartree−Fock and density functional methods.

The second chapter of this book, by R. H. Contreras, J. E. Peralta, C. G. Giribet, M. C. Ruiz de Azua, and J. C. Facelli, deals with another prominent NMR parameter, the scalar coupling constant. As the recent years witness an immense growth in the area of modeling NMR chemical shifts, advances in calculating scalar coupling constants have also been made possible via fast computers, more efficient algorithms, inclusion of electron correlation, and incorporation of relativistic effects. To summarize this progress, a new review chapter on spin−spin coupling constants is necessary, as the last one by Contreras and Facelli was written seven years ago. The mathematics presented in this section is kept to a minimum, with tangibly more emphasis given to trends that can be explained using fundamental concepts in chemistry. The examples used are appropriately chosen, creating a bridge between theoreticians and experimentalists. The trends discussed are relevant to current research areas, as coupling constants have been regularly employed in protein and peptide structure determinations as well as in studies of hydrogen bonding.

S. Dusold and A. Sebald describe recent progress in resurrecting the dipolar interaction in magic-angle spinning NMR experiments. The dipolar interaction, usually averaged to zero in solution or under magic-angle spinning, has been reintroduced lately into solid-state NMR and in solution NMR in the case of partially oriented molecules. Since the dipolar coupling depends on internuclear distances and orientation, observation of this parameter can yield substantial structural information. Dusold and Sebald cover the experimental NMR techniques that have been developed in the past decade on recoupling homonuclear and heteronuclear dipolar coupling interactions while spinning the sample at the magic angle. This review chapter, with its nice illustrations of pulse sequences and sample spectra, is certainly within reach of even those who have just started understanding the basics of solid-state NMR spectroscopy.

The final chapter in this book illustrates one of the areas in which NMR spectroscopy has found a vital role, the study of porous media. P. J. Barrie discusses in this report how relaxation measurements (to measure pore size) and application of gradients (to measure diffusion) in NMR spectroscopy are currently used to characterize rocks, soil, membranes, and other porous media. A short section on magnetic resonance imaging of porous material is added near the end of this chapter.

With the topics described above, it is evident that this book should appeal to a broad scientific audience. All sections have been faithful in citing seminal literature and past reviews, while including most, if not all, recent work in the past 10 years. The chapter on spin−spin coupling alone cites 710 references. For those who have an interest in NMR spectroscopy, this book would be an excellent resource.

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Combinatorial Chemistry: Synthesis, Analysis, Screening. Edited by Günther Jung (Univeristät Tübingen). Wiley-VCH: Weinheim and New York. 1999. vii + 601 pp. ISBN 3-527-29869-X

This is a 20-chapter book from various authors, nearly all from Europe, and most from Germany. Dr. Jung has contributed much to this work, being involved in at least six of those chapters. The organizational details are good, though the overall structure of the book might have been improved by dividing it into three parts, as implied by the title. As written, the logic of the ordering of the chapters is unclear. There is an introduction on basic concepts, appropriately kept to a minimum to avoid overlap with the editor's first book and those of others. Most of the chapters are summaries of the field, rather than comprehensive reviews. In some cases, the discussion seems too brief (fluorous phase work and soluble PEG supports may have deserved more attention, for instance). Some of the chapters can be compared with reviews in the literature that are generally more detailed. The chapter on solid phase synthesis has a tabulated format reminiscent of summaries in *Tetrahedron* by Rees et al. The discussion on templates, linkers, and handles is good, but it would be hard to better Bradley's 2000 *Chemical Reviews* paper in this area. The diversity of subjects covered in this collection reflects the current breadth of the area. There are chapters on DNA and RNA aptamers, an excellent one on combinatorial biosynthesis, and one on heterogeneous catalysis. Overall, the strategy used for defining the scope of this book will please most of the readers, most of the time. In summary, this is a book for the library to buy: it will function as a useful reference for further reading in almost any area of combinatorial chemistry.

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*Unsigned book reviews are by the Book Review Editor.