

Annual Review of NMR Spectroscopy. Volume 46.

Edited by G. A. Webb (Royal Society of Chemistry, London). Academic Press: San Diego, London. 2002. x + 218 pp. \$134.00. ISBN 0-12-505446-7.

This latest volume of reviews in NMR spectroscopy contains four independent chapters covering four distinct topics. Two of these, heteronuclear coupling constants and computer processing techniques in NMR spectroscopy, are of relatively broad interest and application, whereas the others, radiation modification of polymers and dynamics of silk fibroin, are rather specialized. The chapters vary significantly in their quality, as well as in their style. Apart from their common focus on NMR spectroscopy, there does not appear to be any unifying link in terms of content or aim.

A well-written chapter by G. Martin reviews a variety of methods by which heteronuclear coupling constants can be measured or exploited, and how coupling data can be used to yield structural information for molecules of various complexity. The emphasis is on solution NMR methods that are most appropriate for relatively small molecules, rather than methods suited for macromolecules such as proteins and nucleic acids. The chapter contains a substantial amount of practical information regarding the choice and optimization of experiments. Well-chosen examples of spectra illustrate the usefulness of the various methods discussed. The chapter is quite readable and provides historical context along with descriptions of the methods and a review of the literature. A chapter by Jeannerat reviewing computer processing techniques in NMR spectroscopy has the narrower aim of assembling over 500 references covering a wide range of topics in an organized way. There is not a strong

effort to introduce computer processing methods to the uninitiated, and a lack of illustrations may make it difficult for a reader who is not well versed in the methods to follow the discussion. The main usefulness of the chapter is to direct the reader to the original literature describing topics such as the use of window functions, linear prediction, maximum entropy, and spin network determinations, among others.

In a relatively specialized chapter, Kameda and Asakura review NMR spectroscopic studies of the dynamics within silk fibroin, an appropriate topic given the unique mechanical properties of silk, and the unique tools that NMR spectroscopy provides for the experimental study of molecular dynamics. The scope of this review is quite narrow, focusing almost entirely on dynamic processes within silk produced by two species, *B. mori* and *S. c. ricini*; other topics, such as silk structure, or materials, such as spider silks, are barely mentioned. The large majority of the references are to work that was published from 5 to 10 years ago, or more. In another specialized chapter, Hill and Whittaker present a concise review of the historical and more recent contributions that NMR spectroscopy has made to the study of radiation damage to polymers. Topics include ^1H and ^{13}C broadband and solution NMR, as well as ^{13}C and ^{19}F magic angle spinning, and ^{17}O solution NMR spectroscopy.

Overall, this book will serve students and investigators who already have a familiarity with NMR spectroscopy in general and are interested in deepening their knowledge in the specific areas that are discussed.

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