Book Reviews

NMR and Biomolecular Structure

Edited by I. Bertini, H. Molinari and N. Niccolai, published by VCH Weinheim, New York/Basel/Cambridge, 1991, XVII, 209 pp., 85 figs., 7 tables, DM 116.00, £43.50.

I read with interest the book *NMR and Biomolecular Structure*, edited by I. Bertini, H. Molinari and N. Niccolai. It is a fine book, aimed at introducing with simplicity the potentialities of modern NMR spectroscopy in the determination of protein and DNA structure, and the elucidation of the details of their interactions.

The authors succeed in explaining many theoretical aspects needed to understand the results in a way that is accessible to the non-specialist, and yet complete and rigorous. The reader is moved through 1D and 2D theory with little difficulty. The most important phenomenon of the nuclear Overhauser effect (nOe) is explained extensively in its various facets, and its use in structure determination is illustrated in several examples.

The power of the three-dimensional techniques, especially when they involve heteronuclear correlation, is shown clearly and concisely, together with the difficulties connected with them and the possible ways to circumvent these limitations.

The use of distances derived from two-dimensional nOe experiments in computer simulations such as distance geometry and molecular dynamics is described, from the point of view of the NMR spectroscopist, as opposed to the computer scientist. The problem of the quantification of such distances is confronted, and two among the most powerful approaches are presented, based on the calculation of the complete relaxation matrix (CORMA and IRMA).

Several examples involving different structural problems are described in detail, providing the reader with an overview of the kind of questions that can be answered by NMR. The examples range from the determination of protein structure, as in the case of the *lac* repressor headpiece, to the analysis of protein–DNA and protein–drug interactions, as in the cases of *lac* headpiece/operator complex and of dihydrofolate reductase drugs, respectively. These chapters illustrate some of the most exciting results accomplished by NMR in the recent years.

In addition, two rather specific topics are covered, very different from each other; these regard the use of nOe in paramagnetic systems, and the use of ^{31}P NMR in the determination of DNA conformation. The theoretical problems arising from the presence of paramagnetic centers and the technical difficulties involved in the detection of nuclear Overhauser effects in such systems are discussed, together with the successes obtained in the case of superoxide dismutase and the future perspectives of this field. The difficult problem of DNA conformation is also tackled. Two-dimensional techniques involving ^{31}P are illustrated, and an extensive comparison with models derive from X-ray studies is carried out.

Stefano Mammi
Dipartimento Chimica Organica
CNR, Università di Padova
Padua,
Italy

Rodd's Chemistry of Carbon Compounds, Supplements to Volume IV, Heterocyclic Compounds
Part E. Six-membered Mono-Heterocyclic Compounds with a Hetero-atom from Groups IV, VI or VII of the Periodic Table

Edited by M. F. Ansell, published by Elsevier, Amsterdam, 1990, 640 pp., ISBN 0-444-88611-7

This new book, prepared by R. Livingstone, continues the supplementation of the second edition of Rodd's Chemistry of Carbon Compounds and covers Chapters 20 and 21 of Volume IVE.

Chapter 20 (397 pp.) is a readable concise survey of the very considerable amount of work published on six-membered heterocycles containing one oxygen atom.

Chapter 21 (195 pp.) is a review of six-membered ring compounds with one hetero atom: sulfur (155 pp.), selenium (15 pp.), tellurium (5 pp.), silicon (14 pp.), germanium (3 pp.) and tin (3 pp.).

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