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Book reviews

Modern NMR Spectroscopy; by J.K.M. Sanders and B.K. Hunter, Oxford University Press, Oxford, etc., 1987, xii + 308 pages. £35.00 (Hard cover) ISBN 0-19-855191-6. Paperback version £17.50 ISBN 0-19-855202-5.

This book is subtitled "A Guide for Chemists" and the authors set out to bridge the gap between the way NMR spectroscopy is seen by a spectroscopist in physical terms and the way it is seen be a chemist wants to use it to solve chemical problems.

The concepts needed for a basic understanding of modern NMR spectroscopy are clearly explained with the minimum of mathematics, and are illustrated with many vector diagrams. The type of spectrum and information gained from a particular technique usually follows directly after the conceptual background, and this helps greatly when making decisions about what type of spectrum (DEPT, INEPT, COSY, INADEQUATE, etc.) should be recorded to obtain the information required.

The ten chapters are titled "The one-pulse experiment"; "Spin decoupling and difference spectroscopy"; "Multiple-pulse experiments"; "The second dimension"; "Connections through bonds"; "Connections through space"; "Connections through chemical exchange"; "Editing"; "Solids"; and "Sucrose octa-acetate: a case history". "Connections through chemical exchange" is particularly useful and includes clear discussions of spectroscopic timescales, linewidths, NOE's equilibrium processes etc.

The case history of sucrose octa-acetate is an example of how a real problem might be tackled. The problem set is to assign all of the non-acetate signals in the ^{1}H and ^{13}C spectra of sucrose octa-acetate. The reader is taken through the one-dimensional ^{1}H spectrum, decoupling difference spectra, $^{1}H - ^{13}C$ shift correlations and NOE difference spectra which between them yield all of the information required. This is an effective worked example which teaches much about how to look at a problem in NMR spectroscopy and when to apply the various techniques outlined in the book. There is also a useful appendix; "Symmetry, non-equivalence and restricted rotation" which explains the influence of chirality on NMR spectra and why, for example, CH_2 protons in a chain are not necessarily equivalent.

Most of the examples given are from organic chemistry but the techniques can be extended to nuclei of interest in organometallic chemistry. This book must be compared with "Modern NMR Techniques for Chemistry Research" by A.E. Derome published recently by Pergamon. Both are well written and well produced books covering the important aspects of modern NMR spectroscopy. Although Derome's book does not include a chapter on solids it may be favoured by chemists who record their own spectra.

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