

changes in chains—are related to relaxation time and NOE measurements, and the effects of structural changes on the measurements are also discussed. The second part of Chapter 9 is an informative treatment of exchange and relaxation in polypeptides. The last chapter is divided into three sections. The first, devoted to polymeric liquids and gels, consists of 20 pages, which are not sufficient to cover the subject (the author's article on the same theme in *Progress in NMR Spectroscopy* is over 300 pages long!). In the following 40 pages, the NMR of adsorbed species is treated concisely and the author provides an extensive list of references. The final 30 pages of the last chapter deal with NMR spectroscopy and imaging in food science: again, a concise treatment with useful references.

To sum up: this volume is not a textbook—most of the chapters are non-critical reviews written for connoisseurs, and those chapters dealing with theory are mainly also written as reviews. It is a compendium of largely independent descriptions of the applications of relaxation theory to dynamic problems. As such it will be of interest to researchers and students working in these fields, who thus obtain a large collation of equations and a comprehensive list of references. It will also be of use to those working in neighboring fields who wish to see what is going on 'on the other side of the fence.' Analytical chemists and biochemists should look elsewhere.

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A Handbook of Nuclear Magnetic Resonance

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It is too often the case that tomes covering NMR spectroscopy fall in the category 'I own one but seldom read it.' The reason is simple. The experts in the field, that is to say, those driving the theoretical and technical developments and consequently those in the best position to author such works, aim their publications at a level far beyond that needed by the bulk of the practising chemists and biochemists (many of whom suffer a phobia of Hamiltonians). At times, though, many of these researchers need to understand or themselves explain a theoretical concept in a simple or semi-theoretical way. For this purpose there are few references to which they can refer.

At a time when many works were published to disseminate the theoretical details of the emerging field of NMR, Ray Freeman's first edition of *A Handbook of Nuclear Magnetic Resonance* was a welcome arrival. It attempted to present the major ideas in as simple a language as was necessary, listing concise entries alphabetically rather than thematically. No attempt was made by the author to offer this as a comprehensive reference to the field, or as an introduction to the novice, but more as a *handbook* for those with a practical background in NMR—those very chemists and biochemists described earlier. This was its success.

This second edition, coming some 10 years after the first, builds on the original intentions. The format is largely

intact, although the contents have been altered to reflect the developments in the field since the first edition. Sections deemed less important have been merged into existing sections, or replaced by five new sections covering coherence spectroscopy, the measurement of coupling constants, nuclear susceptibility and pulsed field gradients.

Most of the original text has been revised and in almost every case to great effect. The author manages to condense into a few pages what others struggle to achieve in a hefty chapter. One such example is the entry describing the Product Operator Formalism. Here, the language could be simpler, but the ideas are presented well enough for someone without prior knowledge of this topic to understand. The graphics have been updated and in many cases make the description of the concepts clearer. On the whole, the production looks fresh and is well presented.

For the reviewer, the ultimate success of a handbook is not only the information it contains, but the reference listings that guide the reader to a more detailed treatment of a particular subject. To this end, the second edition is a significant improvement over the first, offering most of the original references in addition to many new ones. Some readers may also find the cross-referencing between topics covered in the book useful.

The second edition is a significant improvement on what was already a fine book, with ideas described clearly and eloquently by a scientist whose contribution to the field of NMR is as significant as that by any other.

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