

### Book reviews

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*Modern Techniques in High-Resolution FT-NMR*; by N. Chandrakumar and S. Subramanian. Springer Verlag, New York, etc., 1987, x + 388 pages, DM 136, ISBN 0-387-96327-8.

The casually browsing chemist, encountering equation 83 of chapter 4 of this new book, to take just one amongst many, may well take fright and decide that this is not for him, and on the whole he would be right. For this is a text, written by two experienced workers in the field, that sets out to bring together in one volume the myriad of new NMR techniques, both for the liquid and solid states, and to present them within a consistent theoretical framework. The emphasis throughout is on the physics involved rather than on chemical applications. The theoretical framework is provided by the density matrix formalism, which is set out in the first chapter. The more familiar magnetization vector treatment is also used whenever appropriate, and the clearly drawn diagrams are a great help to understanding. But this simple picture cannot cope with many of the new techniques, particularly those involving multiple quantum coherences. Here density matrices must be used, and though they throw up equations of daunting aspect, the not-quite-so-casually browsing chemist will find that rarely is anything more complex than matrix multiplication involved.

In chapters 2 and 3 a wide range of experiments are presented, including decoupling, the nuclear Overhauser effect, solvent suppression, the DANTE selective excitation method, INEPT, DEPT and the various carbon-13 spectral editing techniques. In chapter 4 we move into two dimensions. An excellent general introduction to the concepts is provided, leading to detailed descriptions of the commonly used 2D experiments. The only notable absentee is the COLOC shift correlation method, a chemically very useful technique which perhaps owes its omission to its theoretical inelegance. Chapter 5 deals with multiple quantum spectroscopy, a rather esoteric area whose most chemically useful manifestation is the INADEQUATE group of experiments. Chapter 6 is devoted to the solid state and both the magic-angle spinning and multipulse line-narrowing families of experiments are described. That the book is right up-to-date is shown by the inclusion of a section on the novel zero-field NMR experiment. The final chapter deals with technical niceties such as composite pulses and contains a short section on NMR imaging.

The book has been produced to the highest standards and at a reasonable price. The presentation of the spectra and other diagrams is generally good, the numerous pulse sequences are set out in a clear format and the text reads well. In short, this book will be a valuable asset to any NMR laboratory, though most readers of this journal will be content to leave it there.

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