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### The Book Corner

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## THE BOOK CORNER

**MODERN NMR TECHNIQUES AND THEIR APPLICATIONS IN CHEMISTRY**, Edited by A. I. Popov and K. Hallenga, Marcel Dekker, Inc., New York, NY 10016, 1991, 680 pp. Price: \$135.00; \$162.00 outside USA and Canada.

The authors of this text, in attempting the impossible feat of putting together, in less than 700 pages, a book that "will inspire the nonspecialist to suggest new applications of NMR spectroscopy", will have met with some success if these nonspecialists are mathematically-oriented. This success would have been greater had the text been rigorously proofed by all of the authors. For example, on page 63 ("Fourier Transform NMR", Chapter 2) one author states that zero-filling the FID "does not enhance the information content of the experiment" while another author, on page 329 ("Quantitative Chemical Analysis by NMR", Chapter 5) states that zero-filling results in increased "accuracy with which peak positions, intensities, and line widths can be determined."

Similarly, in Chapter 2, raising and lowering operators are used to describe the behavior of magnetizations during the spin gymnastics of modern 2D NMR experiments, while Cartesian product operators are used in Chapter 10. In a book of this breadth, the poor but honest spectroscopist doesn't need the mental challenge of both methods! Also, the abbreviated notation on page 102 (Chapter 2) is very confusing; for example,  $I$  and  $1$  are almost indistinguishable and super/subscripts are poorly type set or chosen.

The text has merit as a reference for many excellent NMR techniques and for explanations of basic NMR theories. However, this merit is again diminished by typographical errors. Four examples are given; (1) page 7, equation (17),  $N(1 + \alpha)$  should read  $v_N(1 + \sigma)$ ; (2) page 67, Figure 3 (the Lorentz-Gauss apodization) the labels, (a) and (b), are reversed and (b) is left out of the figure heading, the only place that an explanation is given; (3) page 380 in the discussion of magnetic nonequivalence, Figure IX has  $m$ ,  $m^1$  omitted and Figure XI has  $m$ ,  $m^1$  reversed; and (4) page 99, "the operator rotation" instead of "notation" stops the reader for a while! A more serious type of error is illustrated in the statement on page 102 in the discussion on COSY that "This mixing is made observable by the second 90° pulse." This is inaccurate because the mixing occurs during this pulse, whereas, in multiple quantum experiments, a final 90° pulse often does render magnetization observable that has already been mixed. Mixing never occurs during the evolution period. The publishing of an Errata is essential for this text to be valuable.

It was refreshing to read the description (pages 7-8) of the origin of the confusing misnomer of "upfield" versus "downfield" chemical shift terms because this has confused students of NMR for years. Also, having the math functions of importance in NMR and their Fourier transform partners all in one place, Figure 1, page 59, is convenient.

As with any text by many authors, the chapters vary in information, presentation and scope. The chapters on solids are well presented and informative. The chapter in Quantitative Chemical Analysis is rare and well done. Excellent coverage is given to the care that has to be taken in order to provide quantitative NMR data. The  $^{13}\text{C}$  satellite discussion on page 352 is well done. Also, of particular interest to this audience is the HPLC-NMR discussion on page 354. The lack of discussion of more modern NMR techniques such as HOHAHA or ECOSY in the chapter devoted to organic compounds is compensated by discussion of such experiments in the last chapter, "2D NMR of Biomacromolecules." Also useful are the chapters on Equilibrium Studies in Solution, Reaction Kinetics and Exchange, and Inorganic Compounds.

"Modern NMR Techniques and Their Applications in Chemistry," accompanied by a detailed Errata at a lower price would make a valuable addition to most NMR laboratories, but without the Errata I would not be comfortable recommending it.

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**CHROMATOGRAPHIC ANALYSIS OF ALKALOIDS**, M. Popl, J. Fahrnich and V. Tatar, Chromatographic Science Series, Volume 53, Marcel Dekker, Inc., New York, NY 10016, 1990, 664 pp. Price: \$150.00; \$180.00 outside USA and Canada.

Alkaloids have attracted attention of chemists, biochemists and pharmacologists for decades. The rapid development of chromatographic methods has established it as an essential and useful tool in alkaloid research, separation and quantification.

This book provides an introduction to alkaloids and a comprehensive review of the different chromatographic techniques and methods used for the separation and identification of this class of compounds.

Chapter 1 provides basic information on alkaloids nomenclature, classification, and structures. It is mainly intended for readers not familiar with the chemistry of alkaloids.

Chapter 2 discusses how physicochemical properties of the alkaloids influence the chromatographic process. Dissociation of alkaloids is treated thoroughly as it strongly influences their separation.

Chapter 3 presents a general introduction to chromatography and Chapter 4 provides a basic introduction to gas-liquid chromatography (GLC). This chapter is brief because of the very limited use of GLC methods in alkaloid analysis. Liquid chromatography holds the key position in alkaloid determination, and it is estimated that 60-70% of all separations are presently performed using this technique. Chapter 5 gives a detailed classification of the different LC modes, their mechanism of separation, mobile and stationary phases used for the separation of alkaloids. In addition, the different detection systems are also discussed. Chapter 6 explains the use of thin layer chromatography for the screening of complex matrices.

Chapter 7 is devoted to alkaloid determinations as they are carried out in medicine, pharmacy, forensic analysis, etc. The first part deals with the procedures of sample preparation which are divided according to the sample origin and type. In the second part, the conditions for chromatographic determination are given.

This book is easy to read and informative (1200 references), it will be very valuable for scientists who seek information on the alkaloids and their analysis by the various updated chromatographic techniques. The book is recommended for every chemical, biochemical and pharmaceutical library.

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**LUMINESCENCE TECHNIQUES IN CHEMICAL AND BIOCHEMICAL ANALYSIS**, Edited by W. R. G. Baeyens, D. DeKeukeleire and K. Korkidis, Practical Spectroscopy Series, Volume #12, Marcel Dekker, Inc., New York, NY, 654 pages, 1991. Price: \$150.00 (USA and Canada); \$180.00 (all other countries).

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