

## Book Reviews\*

**Thin Layer Chromatography. Quantitative Environmental & Clinical Applications.** Edited by J. C. Touchstone and D. Rogers. John Wiley & Sons, Inc., New York. 1980. xix + 561 pages. \$42.50.

Thin layer chromatography dates back to the turn of the century although many scientists consider the early forties as the time of birth for modern TLC. Within the last few years another generation of TLC equipment and methodology, categorized as high performance thin layer chromatography (HPTLC), has been promoted. This terminology has its critics who argue that thin layer chromatography has always been instrumentalized and factors such as gas phase control, improved spotting methods, and automated scanning merely reflect refinement of old techniques. The fact however remains that quantitative analysis in TLC or HPTLC at the nanogram level can now routinely be carried out with excellent precision (relative standard deviation of a few percent) under fully automated conditions. Such claims would have been ridiculed just a few years ago.

The editors of this voluminous text have tried to accommodate both conventional and instrumentalized TLC. The book is the outcome of a symposium dealing with clinical and environmental applications of thin layer chromatography which was held in Philadelphia in January 1979. It consists of 36 individual contributions. The editors state in their preface that they "have allowed the authors to tell their story in their own style" which probably explains the considerable variations in quality and depth. The subtitle implies environmental and clinical applications but several technical chapters on instrumentation and methodology are included as well. One of the more notable contributions is provided by the editors themselves in their "preface and overview" of only 3 pages which precedes the text itself. The current state of the art is discussed in a "nuts and bolts" fashion and future developments are forecast.

The general problems encountered in publishing symposium papers are quite evident in this book. The editors have little discretion to balance the content which in this case is heavily slanted toward a few specific applications such as aflatoxins and nitrosamines. Some duplication is unavoidable under such circumstances. In many of the contributions TLC plays only a minor role in the overall analysis. Other chapters are full of experimental details and recipes for specific separations and are as such very useful for other workers in the field.

The book starts out with a historical note by Kirchner, followed by several chapters devoted to sample preparation, sample application derivatization, and instrumentation. The contribution on "quantitative densitometry" contains little information (1 page) on modern densitometers and covers everything from sample application to chromatographic development. The chapters on spotting and instrumentation are up to date (1979) and concise. Fenimore's excellent chapter on drug monitoring by HPTLC is followed by a chapter on "microtechnique TLC" in which the sample is applied as a 2 mm spot—a stark contrast. Application of TLC to the analysis of mutagens, peptides, and boron follows. An editorial note precedes the section on aflatoxin procedures. This subject is treated very thoroughly from all angles. One of the chapters represents a review with almost 200 references. The section on nitrosamines consisting of three papers is equally comprehensive and contains much useful material. Two chapters on polynuclear hydrocarbons prove that TLC is not the only answer to every analytical problem. Detailed workup procedures for the fractionation of this class of compounds from cigarette smoke are provided. TLC plays only a small role in the overall isolation scheme. The following chapter, dealing with use and disposal of chemicals, must have been included by mistake since it has absolutely no component relating to TLC. It is devoted primarily to engineering aspects of incineration. The last 11 chapters deal with biochemical and medicinal applications and cover topics such as the analysis of phospholipids, gangliosides, prostaglandins, lipids, and food residues. Several contributions to the study of metabolites and enzymatic reactions contain not only analytical data but also experimental details such as sample preparation methods and calibration procedures.

It is quite clear the TLC has a strong footing in the clinical and biochemical laboratory emphasizing its superiority in an otherwise "dirty" sample. The book is typed rather than typeset. The reproductions are of high quality and very few errors are apparent. The book is obviously intended for researchers interested in applications and provides excellent information in the key areas mentioned above.

The information is now more than 2 years old and thus does not

include some of the recent significant advances which have contributed to the renaissance of thin layer chromatography in its instrumentalized form. The book is not for everyone but it is extremely helpful for scientists who must use some type of liquid chromatography in environmental and clinical applications.

Wolfgang Bertsch, *University of Alabama*

**Advances in Nuclear Quadrupole Resonance. Volume 4.** Edited by J. A. S. Smith. Heyden Publishing Company, Inc. 1980. 272 pp. \$79.00.

Nuclear quadrupole resonance (NQR) is a field with, in principle, an enormous potential in chemistry. This potential has been as yet largely unrealized, mainly because of experimental difficulties, though progress in resolving these difficulties is slowly being made. It is perhaps not surprising, then, that of the four articles in the fourth volume of this series of advances two are really extensive reviews of work covering a long period of time, while the other two cover more recent developments.

Of the former two articles the first, on study of molecular motion by nuclear quadrupole resonance and relaxation, by H. Chihara and N. Nakamura, will be of wide general use to all NQR spectroscopists. It is chiefly concerned with temperature dependences of coupling constants and spin-lattice relaxation times and their interpretation. There are useful equations, many examples, and 144 references. The second, on deuteron magnetic resonance in crystal hydrates, by A. Weiss and N. Weiden, is much more specialized. The chief motivation of the work is study of hydrogen bonding. The review is extremely thorough, and covers the methods, both experimental and theoretical, of determining these constants. There is a very large number of examples, in both inorganic and organic chemistry, and a discussion of possible interpretations. There are 395 references.

The remaining two articles are of a more introductory nature. The first, on two-frequency methods and double NQR by V. S. Grechishkin and V. P. Anferov, is concerned chiefly with various experiments involving irradiation of two different transitions of the same nucleus of a sample. It provides some useful theoretical background, and description of experiments and applications. The second article, by I. J. F. Poplett, is on dipolar structure in NQR. This is a good example of information which has only recently become fairly generally available with the development of new experimental techniques. The theory of the effect is described along with several different types of experiments and the information obtainable from them.

In all this is a useful and interesting book. Sadly, the price is probably rather too high for most individuals.

M. C. L. Gerry, *The University of British Columbia*

**Perfumery Technology: Art: Science: Industry. Second Edition.** By F. V. Wells and the late M. Billot. Ellis Horwood Ltd.; Halsted Press, John Wiley & Sons, New York. 1981. xi 449 pp. \$110.00.

This is a revised and enlarged edition off the original work published in 1975. The original preface states that it was written "as a compendium of information on the nature and practice of perfumery" and "to provide a reference work for the professional perfumer". It deals not only with the materials used by the perfumer, but also with the nature of odor and its perception and its interaction with flavor and tasting. A substantial section is devoted to formulation and classification of perfumes, several chapters to applications, from manufacturing to marketing, and one chapter to analysis and instrumentation. Chemical structures are absent, but specific odorants are identified by name and their characteristics are given. There is nothing on synthesis, however, and the analytical section is superficial from a chemist's standpoint, being essentially a survey of what exists, with references to more detailed sources (but then, the book is not billed as chemistry).

The latest references are dated 1978, insofar as casual inspection reveals. This fact probably does not detract greatly from the value of the book, for the subject is not highly sensitive to the passage of time. The great value of the book is its comprehensive exposition of a fascinating application of chemistry, and its explanation of the arcane terminology and the important variables in applied odor science. It is not only a useful work of reference to the chemist concerned in any way with odor and flavor, but can provide useful background material for those who teach organic chemistry and must constantly seek ways to snare the attentive interest of students. There is a 9-page index.

\* Unsigned book reviews are by the Book Review Editor.