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# Book review

*Basic Gas Chromatography*, by Harold M. McNair and James M. Miller, John Wiley and Sons, Chichester, U.K., 1998, xiv +200 pp., price £24.95 (paperback); £39.95 (hardbound); ISBN 0-471-17261-8 (paperback); ISBN 0-471-1720-X (hardbound).

Several decades ago the reviewer acted as an instructor with E. Bonelli in a Varian Basic Gas Chromatography Training Course which used very successfully the work *Basic Gas Chromatography* authored by McNair and Bonelli as a text. The work has now been rewritten by McNair and Miller as a volume of The Techniques in Analytical Chemistry Series. The book is concise and well written and continues as a very successful introductory treatment of gas chromatography. The work is recommended to those graduates or undergraduates commencing with the technique. Some knowledge of chemistry and physics as would be gained by undergraduate instruction is necessary to allow an understanding of the fundamentals.

This is fairly small work consisting of 11 short chapter and 9 short appendices or tabulations. Chapter 1 is entitled Introduction and includes a brief history of the technique, some definitions which for the first time have fairly recently been rationalised and concludes with the advantages and disadvantages of gas chromatography. Chapter 2 considers in turn the various factors involved in chromatographic instrumentation. Comparisons between packed and capillary column operation add to the value of the work, although Tables 2.1 suggests that 1/4″ O.D. columns use a sample size of 0.2-20 μl of liquid sample. Such an enormous sized sample is certainly not representative of packed column operation.

Chapter 3, Basic Concepts and Terms, presents a valuable insight into some of the fundamentals on which Gas Chromatography is based. The Chapter helps to eliminate the black box mentality of many technicians and other users who simply inject a sample at one end and hopefully obtain computerised mass spectrometric identification at the other end.

Chapter 4 considers stationary phases for both gas solid and gas liquid chromatography. The classification of phases is briefly outlined, the concepts of polarity and intermolecular forces, of separations factors, of Kovats Retention Indices and of Rohrschneider-McReynolds Constants are included.

Chapters 5 and 6 adequately consider Packed and Capillary Columns respectively and the appropriate inlets. Much has appeared in recent years about various introduction techniques for capillary columns and it is not helpful as shown in Figures 6.8 and 6.9 where the cross section of typical split and splitless injectors are the same, particularly as the text explains that the same hardware is used. A more satisfactory description may have been a single figure with the condition of the split vent being highlighted.

Chapter 7, Detectors, commences with a classification of detectors and details of their characteristics, followed by some of the principal types, flame ionisation, thermal conductivity, electron capture. Other detectors rate a paragraph or two and include mass selective detectors which find much wider application than thermal conductivity detectors which rate three pages.

Chapter 8, Qualitative and Quantitative Analysis, largely features quantitative analysis as qualitative methods have dramatically declined in importance over the last twenty years. The accuracy or precision

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of analysis is paramount. With the widespread use of data handling systems, a understanding of the methods of qualitative analysis is necessary and five methods namely, area normalisation, area normalisation and response factors, external standard, internal standard and standard addition are described.

Programmed Temperature forms Chapter 9 and the importance of temperature in gas chromatography is indicated while the simplified theory of temperature programming is outlined. Special Topics form Chapter 10 and here GC-MS is treated in some detail while to a lesser extent are treatments of chiral separation, headspace sampling and solid phase microextraction. Derivative formation has long been of importance and silylation, acetylation and alkylation applied to compounds with various functional groups are shown. The final Chapter tabulates trouble shooting in a simplified form and provides some insight into the causes of peak deformation.

The work is stated to be designed to serve as a primer/working reference for bench chemists and as a textbook for upper level undergraduates, while these claims may be valid, the value to novices in gas chromatography is apparent and the work is highly recommended as a training aid.

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