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### Book Reviews

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## BOOK REVIEWS

**TOXICOLOGY: A PRIMER ON TOXICOLOGY PRINCIPLES AND APPLICATIONS**, edited by M. A. Kamrin. Pages I–XIII and 1–145. ISBN 0-873711335, Lewis Publishers, Chelsea, Michigan (1988), \$21.85

Overall, this book attempts to put toxic substances in a general perspective for the reader and to appreciate the inherent uncertainties to answer questions about toxic effects of chemicals and risks of exposure to it. The book opens with a discussion of the general principles of toxicology (chemical individuality and toxicity) and some general factors of importance for human risk assessment, such as human variability, toxicokinetics and disposition of chemicals. Subsequently, the organ selectivities of toxic effects (acute, sub-acute and chronic) are discussed with special emphasis on carcinogenesis, mutagenesis and reproductive toxicity. Toxicity assessments (dealing with both the toxicity of chemicals and exposure to it), including epidemiological approaches are also briefly discussed. Risk assessment and risk management are also briefly discussed. In the last part of the book the analysis of four case-studies is described, notably those of cyclamate and saccharin, asbestos, formaldehyde and benzene. In a summary, the similarities and differences in risk assessment are drawn together.

The book is well written and edited with a hard cover; it contains only 10 illustrations, 15 tables and 3 appendices with valuable standard data, reference data on drinking water, air, emission, occupational exposure, etc. It is written from a USA perspective and the reference data presented only contain data from the USA. Because the book is dealing with the various aspects of toxicology rather superficially (it also contains an extensive glossary of toxicological terms), it is primarily suited for interested laymen and students in toxicology. The reference data given in the tables and appendices may be worthwhile for experts in toxicology, too. The level of the book as a whole is for undergraduates.

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**ENVIRONMENTAL TOXICOLOGY: ORGANIC POLLUTANTS** by J. K. Fawell and S. Hunt. ISBN 0-7458-0194-3, Ellis Harwood Ltd., Publishers, Chichester, UK (1988).

According to the authors of this book, drinking water contains a remarkably diverse and complex mixture of potentially toxic, organic chemicals of natural or anthropogenic origin. In this book a reflection is presented of a programme carried out by the Water Research Centre (Medmenham, Bucks) to analyse a range of raw and treated drinking waters prepared from surface water and groundwater sources. In 21 chapters it presents data on the occurrence and mammalian toxicity (acute and chronic toxicity and carcinogenicity in relation to long-term exposure to low levels of exposure) of about 200 environmental chemicals. Hydrocarbons, halogenated compounds, carboxylic acids and esters, and oxygenated compounds are reviewed according to a standard protocol. For example, in the case of chloroform (Chapter 1) after a short introduction (with CAS Reg. No. MW, b.p. odour and taste thresholds), exposures (air, food, water), toxicokinetics in different species and health effects in animals (chronic toxicity, genotoxicity, carcinogenicity and reproductive toxicity) are reviewed. Finally, in a brief discussion-section, these data are summarized and put into the perspective of a risk evaluation.

The reviews described in this book were prepared between 1983 and 1987, which means that some of the reviews are slightly outdated. No clear attempts were made in this book to rationalize the toxicological effects in terms of toxicophoric groups or toxicophoric pathways. Furthermore, only very few chemical structures, biotransformation pathways or otherwise illustrative figures are included in the book. It is also a pity that environmental pollutants that were recently recognized as important, such as soil fumigants and pesticides, are not included in the book.

However, altogether it is a good book. It is a part in the well-known Ellis Harwood Series in Water and Waste Water Technology. It is well produced (with a hard cover), well written and it contains many valuable data and references on circa 200 compounds related to water. It is certainly worthwhile to be used as a book of reference for libraries of environmental and toxicological institutes, for regulatory authorities and for researchers dealing with the various health aspects of organic environmental and water contaminants.

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**BASIC GAS CHROMATOGRAPHY—MASS SPECTROMETRY, PRINCIPLES AND TECHNIQUES** by F. W. Karasek and R. E. Clement, Elsevier Science Publishers.

This book is published in combination with the software package "GC/MS, a

knowledge base". The book and the software can be used together, but also separately.

The book gives a thorough introduction in both the theoretical and practical aspects of GC/MS in four concise chapters. The first two of these handle about GC and MS as stand-alone techniques, the third about the various aspects of GC/MS interfacing, while in the last chapter some selected applications, mainly concerned with analysis of dioxins, are discussed.

The book is based on a GC/MS course. The material is therefore well organized and application-oriented. It can be used by rather unexperienced people, which will find a proper introduction in the field, but also people already working in the field will enjoy reading the book, because most important aspects are conveniently arranged and covered within a limited number of pages. Due to the extensive subject index it is well suited as a reference book. Each chapter finishes with a short list of suggested readings, while no references are given in the text, which is in the reviewers opinion a disadvantage. Although this enhances the readability of the text, it also prohibits a more in-depth study of a particular aspect, starting from this book.

The long production time of a well got-up book like this results in rather obsolete instrument descriptions. Instrumentation in mass spectrometry has changed very rapidly in the last few years.

In conclusion, it can be stated that this is a very nice book, the purchase of which I can certainly recommend, especially in an environment where new people have to be taught about GC/MS. Bench-top GC/MS instrumentation is nowadays introduced in non-specialized laboratories, giving rise to questions this book can answer.

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GC/MS, A KNOWLEDGE BASE, by F. A. Settle and M. A. Pleva, Elsevier Science Publishers (1988).

This software package, which can be used in combination with the book "Basic Gas Chromatography—Mass Spectrometry, Principles and Techniques", by F. W. Karasek and R. E. Clement, or separately, consists of a BASIC program for IBM (compatible) computers, with accompanying data-files (in total about 400 kB on 3 floppies). No special hardware requirements are necessary.

The package is meant to be an electronic pathfinder in the field of GC/MS. It can be used in three ways to obtain information on GC/MS. A data-file about a particular subject can be called directly by means of a 5-character file code. A tree can be followed, which gives information on the files that should be selected on a

particular subject. And the program can be used in keyword mode, starting from a list of keywords and climbing down short abstracts of the data-files mentioned earlier.

The reviewer started working with this package somewhat biased whether this approach to knowledge transfer is useful. The time spent with the program did not alter this bias, which to some extent may be due to the poor programming. At first sight the tree mode is very nice. However, after three steps (at the third branch) the only information obtained is a list of files which should be examined. These files can be called directly using a function key. However, on doing so the screen clears and the list of 5-character files codes disappears. In the keyword mode, the selection of full files is somewhat easier, although still based on 5-character file-codes and from a screen which only contains those codes without any further description. It appears to be necessary to use the file contents list in the manual of the program or to have paper and pencil ready during the work with the program. More powerful solutions to the file selection problem have been demonstrated in other software packages.

All files are text files; no illustrations are available. In this way potential compatibility problems with the various graphics cards are avoided. However, illustrations are powerful in explaining things that are difficult to describe in text, and they enliven the text as well.

Some files looked very interesting to me, but contained no other information than that the users should urge the software developers to give priority to the development of that piece of information. Searching through instrumental aspects, one can easily evaluate how up-to-date the program is. The list of instruments from the various manufacturers lags behind at least three years.

In conclusion, it can be stated that useful information is present in the knowledge base. The access to this information could have been realized more user-friendly. Nevertheless, as a result of the limited size of the files the information can be examined rapidly. That is certainly a nice aspect, which is especially important to unexperienced workers.

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**TROUBLESHOOTING LC SYSTEMS** by J. W. Dolan and L. R. Snyder, The Humana Press Inc., Clifton, New Jersey (1989), 524 pages, \$65.00

A book like this should not be read from cover to cover. The best means of review would be its use in an LC laboratory for a long period and subsequent evaluation. In this case however, the book had to be read before its use.

The book contains a comprehensive approach to troubleshooting of real-world

LC problems. It is divided into three main parts: In the first part, basic material is presented, including a comprehensive set of flow-charts for quick isolation and correction of LC problems. The second part describes all LC parts and modules in detail, the problems related with them, solutions to these problems and problem prevention. The third part is written from the separation problem point of view.

The book will be too comprehensive for the experienced user of LC systems, especially the second part. The information is often too general or too obvious and many statements are unnecessarily repeated. There exist, e.g., a lot of overlap between the problem prevention and the problem solution paragraphs. These chromatographers will probably mainly use the wealth of information from the troubleshooting flow-charts of Chapter 2 and might even prefer to buy LC-troubleshooting software instead of a book like this. Chapter 5, dealing with problem prevention is a good alternative for the similar items in Part Two and will recall several prevention facts which are widely known but not widely practised. Additionally, Chapters 14 and 15 about separation problems can be recommended for the experienced chromatographer.

This book can be strongly recommended for novices in the LC field. All the required practical information can be found in this book. However, some weak points remain which should be mentioned here. Chapter 6 about degassing does not discuss the commercial in-line degassers which can be found in many laboratories. In the same chapter, reference 11 is cited but not given. Chapter 7 discusses pumps and related problems. Too little information is given about syringe pumps which usually contain other types of seals, having their own problems. The incompatibility of piston seals with additives in the mobile phase, e.g. ion-pairing agents, is not mentioned although such additives are known to cause troubles in many laboratories. The chapters about tubing, fittings, injectors, columns, detectors and recorders are generally well-written although in some sections too obvious and occasionally, having too much overlap within these chapters (cf. above).

It would have been worthwhile to add a section about trace analysis to Chapter 14. Phenomena such as strong retention sites and irreversible adsorption have an enormous impact on separation and quantitation, e.g. linearity, especially in trace analysis.

The remaining chapters cover quantitation problems and gradient elution/sample pretreatment. Unfortunately, these chapters are outdated and do not provide the reader with adequate and recent references. Items such as the use of certified reference materials and phenomena such as transcription errors are not mentioned at all although several excellent quantitation and QA/QC papers have been published in recent years. One of the sections deals with the Prep-system which is, as far as I know, for some years not available anymore from DuPont.

A few sections in the book are somewhat dominated by "commercials" for products of the author's company; seemingly Method Development (Chapter 3) and the problem of Wide Bands (Chapter 15) can only be solved by using "DryLab"-software.

The book ends up with a comprehensive Index which provides easy access to relevant sections.

To conclude, the book is well-written and well-organized; it contains a wealth of information for the inexperienced user of LC systems. Also experienced chromatographers will appreciate several parts, especially the comprehensive troubleshooting flow-charts.

This book should not be on the shelf in a library, its place should be in every LC laboratory, in the direct environment of LC users.

M. W. F. NIELEN

**ECOTOXICOLOGY AND CLIMATE, WITH SPECIAL REFERENCE TO HOT AND COLD CLIMATES (SCOPE 38. IPCS JOINT SYMPOSIA: 9).** Edited by P. Bourdeau, J. A. Haines, W. Klein and C. R. K. Murti. 391 pages. ISBN 0-471-91831-8. John Wiley and Sons, Chichester (1989), £55.00.

During the past two decades, a growing awareness of the principles governing the behaviour and effects of environmental chemicals has been developed in countries with histories of long exposure to anthropogenic chemicals, which are mostly located in temperate climate zones. However, man-made chemicals are increasingly used throughout the world, particularly in regions outside the temperate zone, where most of the developing countries are situated. Moreover, it has been recognized that chemicals used or generated in one region may transcend its frontiers and affect ecosystems situated in other regions far away.

In this context it has become important to investigate whether the ecotoxicological concepts and principles evolved as a result of studies in conditions prevalent in industrialized countries are universally applicable to situations in warm (hot, wet and dry) and cold climates.

This publication contains the papers presented in a Workshop organized in 1985 by SCOPE and the International Programme on Chemical Safety (IPCS). The background material presented includes overviews on climates of the world from an ecotoxicological angle, the diversity of ecosystems, atmospheric transport of chemicals and aquatic transport of chemicals. The environmental fate of chemicals determined by abiotic degradation and by biotic degradation is also described as well as the existing knowledge of exposure of non-temperate ecosystems to environmental chemicals for cold environments (arctic and subarctic) and for tropical and arid regions. Finally, eight case studies are presented: coastal pollution in the Indian subcontinent, biodegradation of pesticides in rice ecosystems, effects of insecticides on rice ecosystems, fate and effects of aldrin/dieldrin in terrestrial ecosystems in hot climates, blackfly control in West Africa, herbicides in warfare and effects of coastal ecosystems, effects of pesticides in Egypt and mercury in Canadian rivers.

This publication represents the first systematic attempt to examine the applicability of ecotoxicological principles in non-temperate climate zones. The report highlights areas where data are particularly lacking and recommends fields for further research and monitoring. The only questionable aspect is that the time elapsed between the celebration of the Workshop and the publication of the Proceedings (four years) is too much for providing updated information on the growing research activities undertaken in developing countries.

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