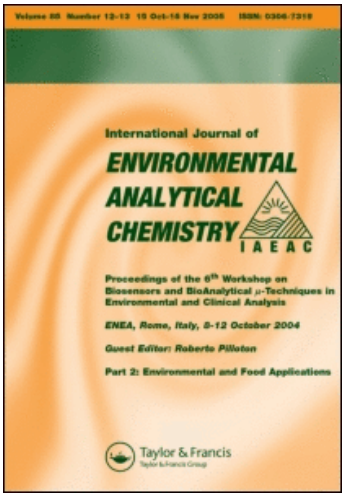

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Book Reviews

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Book Reviews

HALOGENATED BIPHENYLS, TERPHENYLS, NAPHTHALENES, DIBENZODIOXINS AND RELATED PRODUCTS, R. D. Kimbrough (ed.). Elsevier Biomedical Press R.V., Amsterdam, NL, US $95.00, Dfl. 195.00.

During the last 15 years, the halogenated aromatic compounds have become increasingly important in many disciplines of environmental research. The principal grounds for this interest stem from the toxicological properties of this class of compounds, particularly a high fat-solubility, resulting in accumulation in food chains, and a very low degradability. Therefore, a volume on halogenated biphenyls and related products is an obvious and well-timed addition to the Series on Topics in Environmental Health.

Chapters 1–3 give an introduction to the class of compounds.

Chapter 1 outlines production, properties and usage of the chlorinated biphenyls, terphenyls and naphthalenes and of brominated biphenyls and terphenyls. This chapter will be of use for all those who are interested in the roots of this major environmental issue. Many interesting facts are mentioned, including production data of the major manufacturers and trade-marks for commercial brands.

Chapter 2 reviews the analytical methods including extraction procedures and purification of different matrices. The main part of this chapter deals with the dibenzodioxins and the dibenzofurans; methods for PCB's, PCN's, PBB's and PCT's are briefly mentioned. However, a discussion is lacking on the very serious and interesting problems dealing with the quantitation of PCB's in environmental samples. In particular, a view on the differences between, let us say, the North American and the European approach, or rather between the use of packed column pattern comparison and the use of high resolution capillary chromatography for preselected isomeric quantitation, would have been a valuable addition. Moreover, the use of GCMS for confirmation purposes is now generally adopted as indispensable in these types of analysis. This very fact is not mentioned as such in the section on PCB analysis.

For obvious reasons, the size of Chapter 3 on environmental pollution of air, water and soil, has been kept to a minimum. Firstly, only the environmental levels generally found are reviewed. Secondly, it is surprising, that, despite the fact that the substances, this volume deals with, are increasingly becoming a subject of major concern, little investigations have been carried out to collect reliable data on their environmental levels. In fact, such data are only available for the PCB's, at present. The analytical problems involved in collecting these data are a limiting factor here, of course.

Chapter 4 deals with metabolism and bioaccumulation. It consists of a well documented review on experimental data and gives the various mechanisms known at present to be involved in substance-breakdown and accumulation of substances and/or metabolites.

The purpose of Chapter 5 on chronic toxicity is to delineate certain aspects of toxicity, i.e. carcinogenicity, teratogenesis, mutagenesis and effects on reproduction in animals. Emphasis has been laid upon dioxins and biphenyls, since less is known about naphthalenes and furans, and very little about terphenyls. This chapter is well illustrated and every section contains a useful summary of the toxicological potential of these compounds.

In Chapter 6 an attempt to a more theoretical approach of the biochemical activity of the halogenated aromatics is given, by reviewing known structure-activity relationships.

In Chapter 7, a specific toxic effect of certain halogenated hydrocarbons, viz. the chemical porphyria, a type of liver malfunction, is discussed. Although the mechanism of porphyrinogenic action of hexachlorobenzene—the most extensively studied agent—and related polyhalogenated aromatics is still unknown, these compounds seem to affect the porphyrin metabolism in a common way. Biotransformation of the agent seems to play a major role here.

In Chapter 8, another type of specific activity, viz. the influence on the immune system, is reviewed.

Finally, Chapter 9 deals with human exposure, including sections on general population exposure, the Yusho incident, the TCDD contamination in Vietnam, Missouri and Seveso and occupational exposure. Many useful figures are given in these sections, like for instance those on PCB levels in human milk and adipose tissue. This chapter gives the reader a good understanding of the environmental hazards that attend the production and consumption of these compounds.

This volume illustrates many sides of the problems environmental scientists have to cope with when dealing with these substances. It consists of well documented contributions of recognized experts in the various

fields. Although the "environmental health" has to be interpreted as of a mainly anthropogenic nature in this volume, the lack of a more ecotoxicological view is, on the one hand, explainable on account of the few data available, and, on the other, more than offset by the quality of the various contributions and the volume as a whole. No need to say the purchase is recommended.

PIM DE VOOGT

CHROMATOGRAPHY AND THE ENVIRONMENT, Environmental problem solving using gas and liquid chromatography, R. L. Grob and M. A. Kaiser, Elsevier, Amsterdam, 1982, XII+240 pages. ISBN 0–444–42065–7.

In Volume 21 of the well known Journal of Chromatography Library series R. L. Grob and M. A. Kaiser devote some 230 well readable pages to environmental problem solving by means of chromatographic techniques. After two short introductory chapters, attention is directed to the all too often rather neglected theme of sampling techniques (defined as processes performed outside the laboratory). The statistical background of sampling, grab sampling, adsorption, freeze out and trapping techniques are among the many topics discussed. Liquid–liquid extraction, headpsace equilibration and the use of derivation procedures are the principal topics in the chapter on sample treatment (preparing a representative sample for analysis) which is relatively short and, unfortunately, not too well balanced in places.

Gas chromatography (GC) still is a much more important technique for environmental analysis than is liquid chromatography (LC), and this is reflected in the relative size of the next two chapters (50 vs. 15 pages). For both techniques the text, of necessity, is a rapid overview of basic aspects such as selection of separation conditions, detection principles and use of retention indices rather than a detailed discussion of either these or more advanced chromatographic topics. As for GC, a representative listing of the more recent methods for the analysis of air and water samples for many of the commonly encountered pollutants serves a highly useful purpose; the total number of references is 379. The chapter on LC is slightly disappointing. To quote some examples, the section on detectors devotes as much attention to refractive-index and wire-transport detectors as it does to UV absorption and fluorescence detectors, modern developments such as on-line trace enrichment and LC-MS are mentioned hardly, if at all, and there are only 46 references.

The final two chapters deal with safety in the chromatographic laboratory (these pages should have been used to include more about chromatography in the laboratory!), and regulations, and international and national (22 countries) regulatory and advising groups.

The use of gas and liquid chromatography as techniques of analysis, and the selection of the environment as the field of application makes for a combination well suited to attract the attention of a large number of chemists. The particular blend provided by the present book makes it, in my option, primarily useful for the environmentalist who wants to use chromatography to solve his daily problems, and who wishes to avoid pitfalls during the pre-chromatography steps of sampling and sample preparation. He will find much valuable information in the present text, inclusive of a large number of references. He should also realise, however, that relevant chromatographic topics such as the use of thin-layer chromatography as a screening technique, capillary GC, and even GC/MS, are dealt with very summarily. For actual chromatograms, MS spectra or a real discussion on how to increase the sensitivity and selectivity of detection he will have to search the (quoted) literature. Obviously, the book is of much more limited value to the active chromatographer. Still, even for him attentive reading of a chapter such as that on sampling techniques may well be rewarding.

U. A. TH. BRINKMAN

MECHANISMS OF TOXICITY AND HAZARD EVALUATION, Volume 8 of Developments in Technology and Environmental Sciences, by Prof. Dr. Bo Holmstedt, *et al.*, Karolinska Institutet, Stockholm, 664 pages (including 164 figures, 144 tables, an author index of 4 pages, and a subject index of 7 pages), linen, format 247 × 144 mm, ISBN 0-444-80293-2, Elsevier/North-Holland Biomedical Press, Amsterdam (1980) US $79.—, Dfl. 162.—.

96 Papers were selected from about 500 papers presented at the Second International Congress on Toxicology held by the International Union of Toxicology (IUTOX) in Brussels, Belgium, July 1980. The proceedings are structured into nine chapters.

—Recent Developments in Mechanisms of Neurotoxicity
—Short-Term Tests for Predicting Long-Term Effect.
—Early Changes in Chemical Carcinogenesis
—Long-Term Exposure to Occupational Intoxicants
—Clinical Toxicology

—Legislative, Scientific and Socioeconomic Considerations Underlying Toxicological Testing of New Chemicals
—Metabolism and Hepatotoxicity
—Metals
—Pesticides and Miscellaneous.

Five symposia formed the basic structure of the meeting, and 25 invited papers and 71 related free communications were included in the volume. Although many other contributions had to to be deleted for lack of space, the useful book informs scientists, governmental officials and all interested in mechanisms of action and hazard evaluation of chemicals about the state of the art, which has greatly improved since the First Congress in Toronto 1977. The reader finds useful references at the end of each paper. The field of hazard assessment is more or less restricted to the discussion of short-term testing for prediction of long-term effects and of clinical toxicology. But there are many new informations about biochemical effects, about animal toxicology and about some observations in man, especially after occupational exposure. Three papers of S. D. Murphy, Houston, of W. N. Aldridge *et al.*, Carshalton, and of H. Kienhuis *et al.*, TNO Rijswijk deal with toxic interactions of organosphosphates. More emphasis is given to effects of chlorinated hydrocarbons (such as tetrachloroethylene), HCB, PCB's and TCDD) and of metal compounds (such as derivatives of cadmium, lead, mercury, thallium and zinc, including interactions).

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