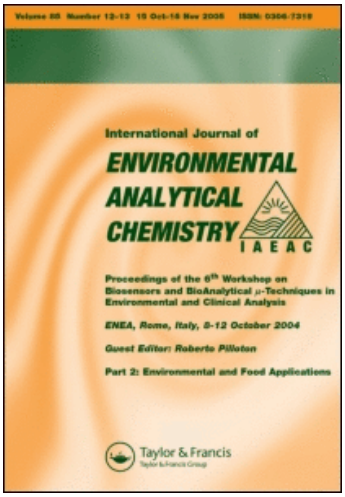

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BOOK REVIEWS

HANDBOOK FOR ESTIMATING PHYSICOCHEMICAL PROPERTIES OF ORGANIC COMPOUNDS, by M. Reinhard and A. Drefal, 228 pages, J. Wiley, New York (1999). ISBN 0–471–172634. UK £ 210.00

This handbook brings together in one volume a vast array of property estimation methods for organic compounds from more than 2,700 published sources. Density and molar volume, refractive index and molar refraction, surface tension and parachor, viscosity, vapor pressure, enthalpy of vaporization, boiling point, melting point, water solubility, air-water, octanol-water and soil-water partition coefficients estimation methods are described.

The property estimation methods have a broad applicability and practical value. The discussion of each estimating technique includes a clear exposition of the technique, classes of compounds for which is applicable and a critical consideration of its strengths and weaknesses. Worked examples are also included to demonstrate the different estimation methods.

Furthermore, the *Handbook* can be used on its own or in tandem with the *Toolkit for Estimating Physicochemical Properties of Organic Compounds* (Windows™) that uses rapid estimation routines and flexible search capabilities. The *Toolkit*CD contains a database of 24,000 organic compounds and a software for property estimation.

Therefore, this book is very useful to environmental chemists, civil engineers, modellers and ecotoxicologists for predicting the bioactivity of a chemical, its bioavailability or its behavior in chemical separation and distribution in environmental compartments. The large number of undocumented properties for a large portion of the 70,000 organic compounds inventored in the environmental regulatory agencies and the additional 2,000 introduced on the market every year, justifies the need of this *Handbook*.

J.M. Bayona
CID-CSIC
Barcelona, Spain.

THE CHEMISTRY OF POLLUTION, by G. Fellenberg, 192 pp. J. Wiley & Sons, Chichester, U.K. (1999). ISBN 0–471–980889. UK£ 24,95.

This book was originally published in german, in 1977, and provides an overview of the important chemical aspects of pollution occurring in the atmosphere, in water and in soil.

The different chapters deal with changes in the atmosphere (dusts, aerosols and gases, carbon dioxide, sulfur dioxide, nitric oxides and CFCs), impairment of ground and surface waters, ground and soil pollution, as well as with widespread chemicals (PAHs, organochlorines, etc.), foodstuffs (foodpreservatives, mycotoxins, etc.), consumer goods (pesticides, detergents, etc.) and radioactivity.

The coverage is at the basic level and includes not only a description of sources and fate of pollutants but also some information on biological effects and cleaning technologies. This book is primarily intended for students, but also for those interested in a general presentation of the chemical principles of environmental issues. The multiplicity of environmental problems is demonstrated through the use of examples showing their relation to biochemical processes, toxicology climate, ecological aspects and other adjacent sciences.

NATURAL ATTENUATION OF FUELS AND CHLORINATED SOLVENTS IN THE SUBSURFACE, by T.H. Wiedemeier, H.S. Rifai, C.J. Newell and J.T. Wilson, 617 pages, J. Wiley, New York (1999). ISBN 0–471–19749–1. UK £ 58.50

Natural attenuation, also referred to as intrinsic or passive remediation, has emerged as an approach of choice for remediating groundwater of many contaminated sites. Relying on the assimilative capacity of a groundwater system is a nonintrusive, and cost-effective alternative to standard remediation techniques for environmental contamination. This book is intended to combine the presentation of the theoretical and practical aspects of understanding, evaluating, and quantifying natural attenuation. The relevant scientific literature is summarized, and information from several databases is also included.

The book describes both biotic and abiotic natural attenuation processes, focusing on two of the environmental contaminants most frequently found in groundwater, namely fuel hydrocarbons and chlorinated solvents. The authors draw on a wealth of combined experience to detail successful techniques for simulating natural attenuation processes and predicting their effectiveness in the field. They also show how natural attenuation works in the real world, using numerous examples and case studies from a wide range of geographic and hydrogeological conditions. Site studies are located in regions as far removed and

varied as Hawaii, Alaska, Florida, New York and California. Although the book is focused on fuels and chlorinated solvents, much of the information presented can be applied to understanding the behaviour of other contaminants. Finally, the book discusses the evaluation and assessment of natural attenuation and explore the design of long-term monitoring programs.

This is an essential reading for scientists and engineers in a range of industries, as well as public environmental regulators, and professors and graduate students in environmental or chemical engineering.

UNDERSTANDING OUR ENVIRONMENT, 3rd. edition, edited by R.M. Harrison, 445 pages, The Royal Society of Chemistry, Cambridge (UK) (1999). ISBN 0–85404–584–8. UK £ 19.95

It was in 1986 when the first edition of this book was commissioned by The Royal Society of Chemistry. The book that was intended for any reader requiring a grounding in the basic concepts of environmental chemistry and pollution, found widespread use as a text book for both undergraduate and postgraduate students.

After a reformulation of its contents in 1992, it has been fully updated in this edition.

This third edition deals with many of the chemical fundamentals, as well as the behaviour of environment systems such as the atmosphere, freshwaters and oceans. It emphasises the inter-linkages between environmental media, which are so important for persistent pollutants, summarises the major human and environmental impacts of pollution and introduces the institutional measures needed for control. This edition is written with a more international approach. The use of case studies and the incorporation of worked examples makes it particularly adaptable for teaching in a variety of contexts.

This book will be essential reading for students in environmental science and related areas, as well as scientists and engineers in industry, public service and consultancy, requiring a basic understanding of environmental processes.

ENDOCRINE DISRUPTING CHEMICALS, Vol. 12 of Issues in Environmental Science and Technology, edited by R.E. Hester and R.H. Harrison, 152 pages, Royal Society of Chemistry, Cambridge (U.K.) (1999). ISBN 0–85404–255–5. UK£ 25,00

The endocrine disrupting chemicals (EDC) issue is undoubtedly a very important one and should be a major concern for all those producing or using chemi-

cals. The multiauthored volume seeks to review the scientific evidence on EDC and to put the subject into a context.

The volume starts with an overview of the endocrine disrupter issue from the toxicological and regulatory standpoints. The following chapters go into more specialized aspects in relation to wildlife, including fish, invertebrates, mammals, birds, reptiles and amphibians. The topic of environmental oestrogens and male reproduction is reviewed and highlights the many difficulties faced in order to establish whether the presence of endocrine disrupters in the environment is a health risk. The intriguing issue of oestrogenic substances which occur in plants, including those used in human foodstuffs, is also dealt with the aim of identifying possible causes of concern. Finally, a chapter on the EDC issue from the US perspective complements the predominantly European one of the preceding chapters.

As the other volumes of the series this book, written by known specialists, will be of interest to a wide readership, including industrial and environmental scientists, manager and policy markers.

METHOD PERFORMANCE STUDIES FOR SPECIATION ANALYSIS. by P. Quevauviller, 271 pages, The Royal Society of Chemistry, Cambridge (U.K.) (1998). ISBN 0–85404–467–1. UK£ 59,50

The book is the result of an extensive collaborative effort throughout Europe on speciation of metals, sponsored by the SM&T programme of the European Commission.

Speciation is one of the growing features of analytical chemistry of this decade. The environmental fate and effects of metals, including toxicity, cannot be satisfactorily understood without considering their chemical forms. Therefore, all those who perform or use speciation analysis will acknowledge the publication of this carefully organized and authoritatively written book.

Besides the different analytical techniques, the results of the certification of Reference Materials are extensively discussed. Collaborative inter-laboratory trials have done much to increase awareness of the strengths and weaknesses of many of these techniques and to significantly improve the quality of analysis.

After a general introduction on the objectives and source of errors in speciation analysis and the aims and principles of quality assurance practices, the text critically evaluates the performance of different methods for speciation of mercury, tin, lead, arsenic, selenium, chromium and aluminium. The sequential extraction of sediments, soils and sludge-amended soils are also introduced. In summary,

this unique book will be an essential reading for people concerned by metals speciation in academic industrial or governmental institutions.

GLOBAL AQUATIC AND ATMOSPHERIC ENVIRONMENT, by H.D. Kumar and D.P. Häder, 393 pages, Springer, Berlin (1999). ISBN 3–540–65369–4. USD 229.00

This book gives an overall picture of the general state of the world's aquatic resources-rivers, lakes, wetlands and oceans- and of the atmospheric changes taking place in the troposphere and the stratosphere.

The key environmental features of water bodies are stated briefly, along with generalizations about their biotic and abiotic characteristics. Wherever possible, special focus is on how human activities have changed an aquatic ecosystem from its natural state. Remedial action to control or prevent further deterioration is suggested along with ways and means to restore the quality of some of the affected systems.

The other area of concern is the atmosphere which shows serious signs of global pollution. Two chapters are devoted to tropospheric and stratospheric ozone changes, and consequent UV-B radiation effects on terretrial and aquatic ecosystems and human health.

Besides to be too ambitious in its scope, the summarized scientific findings and views help to identify and implement sound preventive, corrective and remedial measures to cope with today's environmental problems. Special reference is made to those existing in developing countries, although, as it is indicating in the Preface, the pollution of poverty is perhaps the most threatening of all.

The book makes extensive use of illustrations, that will be of particular interest in teaching courses on the global environment.

BIOACCUMULATION. New Aspects and Developments, edited by B. Beek, 284 pages, Springer, Heidelberg, 2000. ISBN 3–540–62575. USD 143.00

This is volume 25 of the section on Reactions and processes of The Handbook of Environmental Chemistry edited by O. Hutzinger.

Since the publication of the first monography on bioaccumulation, in Vol. 2B (1982) of the series, the variety of compounds of concern has increased as well as the concepts behind. The bioaccumulation of endocrine disruptors, persistent organic chemicals and other compounds of high environmental impact has become of increasing interest in most recent environmental research, risk analysis and toxicology.

This book gives a state-of-the-art report on reliable determination of bioaccumulation and an up-dated review of bioaccumulation of organic compounds, including endocrine-disrupting chemicals and persistent organic pollutants, in fish and other organisms in the first chapter, that includes more than 400 references. In the second chapter a cocept of the Internal Effect Concentration as a link between bioaccumulation and ecotoxicity is presented. The internal concentration deals with additivity of mixtures of chemicals, and it may become indeed more meaningful in the future to compare additive internal "matrices" of groups of responsible for biological (toxic) effects. In the final chapter a review is given of existing concepts for the assessment of bioaccumulation, biomagnification through the food web and secondary poisoning due to the enriched concentrations of environmental chemicals in food.

INTERLABORATORY STUDIES AND CERTIFIED REFERENCE MATERIALS FOR ENVIRONMENTAL ANALYSIS. The BCR approach, by Ph. Quevauviller and E.A. Maier, 558 pages, Elsevier Science, Amsterdam NL, (1999). ISBN 0–444–82389–1. USD 251.50 (Euro 224.62).

Reference materials and interlaboratory studies are two major tools that are available to laboratories for the verification of the accuracy of analytical measurements and for implementing quality control systems. The European Commission has been active in the past 15 years, through the BCR programme (now renamed Standards, Measurements and Testing Programme) in the organization of a series of interlaboratory studies covering various analytical fields (inorganic, trace organic and speciation analysis applied to a wide variety of environmental matrices).

This is an excellent and timely book that gives an extensive and very coprehensive account of the importance of reference materials for the quality control of environmental analysis. The book describes in detail the procedures followed by BCR to prepare environmental reference materials, including aspects related to sampling, stabilization, homogenisation, homogeneity and stability testing, establishment of reference (or certified) values, and use of reference materials. Examples of environmental CRMs produced by BCR within the last 15 years are given, which represent more than 70 CRMs covering different types of materials (plants, biological materials, waters, sediments, soils and sludges, coals, ash and dust materials) certified for a range of chemical parameters (major and trace elements, chemical species, PAHs, PCBs, pesticides and dioxins). The final section of the book describes principles and organizational aspects of interlaboratory studies, with case studies illustrating improvement and proficiency-testing schemes for the evaluation method or laboratory performance.

The book is especially suited for university libraries, metrological institutes, accreditation bodies and institutes responsible for the organization of proficiency testing and all laboratories involved in environmental analysis that are obliged to provide reliable data in support of EC regulations, trade and monitoring activities.

J. Albaigés
CID-CSIC
Barcelona, Spain