

This article was downloaded by:

On: 17 January 2011

Access details: *Access Details: Free Access*

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



International Journal of Environmental Analytical Chemistry

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713640455>

Book Review

To cite this Article (1999) 'Book Review', International Journal of Environmental Analytical Chemistry, 73: 1, 71 – 77

To link to this Article: DOI: 10.1080/03067319908032652

URL: <http://dx.doi.org/10.1080/03067319908032652>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

BOOK REVIEWS

CHEMODYNAMICS AND ENVIRONMENTAL MODELING. An introduction, by S. Trapp and M. Matthies, 285 pages, Springer-Verlag, Berlin (1998). ISBN 3-540-63096-1. DM 128.00

Since the beginning of the public concern for the presence of chemicals in the environment, the need for tools to predict their behavior, namely their transport and fate, under different conditions has been recognized. Exposure models have been developed for risk and hazard assessment and, giving a range of results, may help in supporting decisions.

The book is a comprehensive introduction to the subject, so particularly suitable for students and environmentally-oriented scientists. It contains two parts. Part one is the text book which allows the reader to learn the basic concepts about the dynamic behavior and exposure estimation of chemicals in the environment. This includes the fundamental mathematical and chemistry principles for model development (e.g. mass balance, diffusion, dispersion, partitioning, metabolism and elimination) followed by a guide to exposure models for all environmental compartments (e.g. contaminants in surface water, transport and transformation of compounds in soil, atmospheric transport, uptake by plants and food chains). To help with the understanding of the calculations, exercises of different levels are added to each chapter, with solutions given at the end of the book.

Part two is the software tool "CemoS" (Chemical exposure model System) which includes nine exposure models, a substance data base with twelve data sets, data estimation routines, quality assurance tools and a hypertext online help.

In summary, a reference book for graduate and post-graduate courses on environmental science and technology with one common concept. The simpler rather than the more complex are the multi-media models presented which, in any case, as pointed out in the book, should not be overestimated.

CHEMICAL ELEMENTS IN THE ENVIRONMENT. Factsheets for the Geochemist and Environmental Scientist, by C. Reimann and P. de Caritat, 398 pages, Springer-Verlag, Berlin, (1998). ISBN 3-540-63670-6. USD 110.00

Twenty years after the publication of the Bowen's "Environmental Chemistry of the Elements" a new and updated compilation of existing data on the occurrence, abundance and distribution of chemical elements in the different environmental compartments has been published. The authors themselves are questioning about the need for such a book and the real utility of the data included because of the difficulty in selecting comprehensive data from different samples, taken at different sites by different working groups.

To this end the authors have tried to collect reliable information on the 92 elements reported to occur in nature. The resulting factsheets, which form the core of the book, consist of four pages of data from each element. For each of these elements is given essential physico-chemical information, followed by abundances in typical rocks and crust materials, and typical and possible host minerals likely to contain the element in question. The total mass in the continental crust, in the oceans and in plants is also given. Subsequently, the concentrations of each element in various geochemical or environmental compartments are listed. These include rocks, soils and sediments, continental and marine waters, rainwater and snow, air, plants and even human body fluids. Finally, each factsheet is closed with a discussion of the biological significance, uses, environmental pathways, mobility, action levels, world yearly production and market prices of each element.

Certainly, there are numerous questions that may concern natural scientists which will find adequate answer in this book. Although it is primarily intended for geochemists and environmental chemists, the combination of facts and actual data, makes the book suitable for learning and teaching geochemistry as well.

DICTIONARY OF ENVIRONMENTALLY IMPORTANT CHEMICALS, by D.C. Ayres and D.G. Hellier, 332 pages, Blackie A. & P., London (1998). ISBN 0-7514-0256-7

This book is a compilation of about 600 substances which are included in the lists of priority pollutants established by the following regulatory agencies: American Conference of Governmental Industrial Hygienists, European Community Directives of Dangerous Substances, German Commission for Investigation of Health Hazards of Chemicals, International Agency for Research on Cancer and the US EPA.

Each entry gives the CAS No. of the chemical, to enable a more extensive search, some physical properties, its main sources and uses, the LD₅₀ and LC₅₀, as well as other relevant information of environmental significance. Following the main entries is a list of further reading.

The book will be of use to industry and government professionals as well as to general readers with an interest in the environment, particularly to those writing for the media on environmental topics.

SENSOR SYSTEMS FOR ENVIRONMENTAL MONITORING, edited by M. Campbell, Blackie A&P, London (1998). £125.00. Vol. I: 309 pages, ISBN 0-7514-0418-7. Vol. II: 359 pages. ISBN 0-7514-0419-5

The complexity of the environment and the nature of pollution present a range of difficulties which must be overcome in monitoring systems implemented to ensure compliance with existing legislation. Sensor systems may provide solutions to these complex problems and offer practical options which could be difficult to achieve using laboratory-based analytical chemistry.

These two volumes describe the sensor systems which can be applied to environmental monitoring. The first is focused on sensor technologies, on the chemical and physical principles on which they are based, and the advantages and disadvantages they offer. Chapters on fibre optic and integrated optic sensors, laser-based and electrochemical sensors, gas sensors and analysers, piezoelectric sensors, biosensor devices and automated measurements, give a comprehensive account of the existing techniques available for obtaining from an in-situ chemical measurement a signal that can be processed, transported, interfaced or stored on real-time. The second volume refers to applications for monitoring land, water and air pollution, indicating not only the performance and possibilities of the existing devices but also future requirements for routine monitoring of these environmental compartments. Chapters on industrial methods for process control and measuring noise and vibration and ionising radiation are also included.

Analytical chemists and environmental scientists in industry or academic research as well as industrial environmental managers will find these books a reference source of information to this important field.

PHYSICAL AND CHEMICAL PROPERTIES OF AEROSOLS edited by I. Colbeck, 465 pages, Blackie A & P, London (1998). ISBN 0-7514-0402-0

The book has its origin in a short course on "Aerosol properties and instrumentation" designed for scientists and engineers. Written by established experts in the

field, covers the basic principles of aerosol science as well as introducing more advanced concepts. The treatment should give the reader a basic idea of the scope of the subject and of its applications.

The book opens with a brief introduction to aerosol science. Chapter 2 describes generation and calibration methods, while sampling principles are discussed in Chapter 3. Chapters on diffusion and coagulation, electrical and thermodynamic properties, and filtration follow. Aerosols are ubiquitous in our environment, and Chapter 7 describes the various sources of atmospheric aerosols. The final three chapters concentrate on applications of aerosol science: the emerging importance of aerosol science in material synthesis is presented in Chapter 8. The significance of pharmaceutical aerosols is examined in Chapter 9; and computational fluid dynamics as a tool to enable an understanding of aerosol sampling is addressed in Chapter 10.

Although the use of certain mathematics is essential for the treatment of some topics, the authors have strived to provide clear indications of the different developments. The references are well up-dated and constitute an additional and useful source of information. This book forms, indeed, a timely and accessible overview of aerosol science and technology.

ATMOSPHERIC PARTICLES, edited by R.M. Harrison and R.E. van Grieken, 610 pages, J. Wiley & Sons, Chichester, UK (1998). ISBN 0-471-95935-9. £ 110.00

This is vol. 5 of the IUPAC Series on Analytical and Physical Chemistry of Environmental Systems. In this volume leading scientists review and evaluate the latest knowledge on sampling characterization and properties of atmospheric particles. In fact, this is one of the first books to examine the fundamental aspects of aerosol science relating to particles in the atmosphere, including the sources and size distribution of airborne particles, the means of sampling and chemical analysis, and the serious health implications of particles in the urban atmosphere. Contributions on inorganic and organic composition of atmospheric aerosols and source inventories as well as on dry deposition and wet processes affecting their dynamics in the atmosphere are particularly relevant. Moreover, new and concurrent aspects for which reviews are very scarce, such as the influence of atmospheric aerosols upon the global radiation balance, are also discussed.

This is an excellent overview of current research and forthcoming developments in this rapidly expanding area, which will be of interest to graduate students and researchers working in atmospheric science, environmental analysis, pollution chemistry and global change.

THALIUM IN THE ENVIRONMENT, edited by J.O. Nriagu, 284 pages, J. Wiley & Sons, Chichester, U.K. (1998). ISBN 0-471-17755-5. £70.00

This is part of the series on *Advances in Environmental Science and Technology* that has been edited by J.O. Nriagu since 1969. Since vol. 17 (1986) emphasis has been placed on toxic metals in different environments, as well as on specific elements, like cadmium (vol. 19), chromium (vol. 20), nickel (vol. 25) and arsenic (vols. 26 and 27).

The present volume (29) is devoted to thallium, a metal that has a wide range of uses, increasing particularly by the development of emerging technologies (semiconductors, photoelectric cells, etc.). This has raised new concerns about the health risks and environmental toxicology of this element and the interest of this monograph.

As indicated by the editor, this volume represents an attempt to bring together the global literature on biological chemical, and clinical studies on thallium in various environmental media. Individual chapters cover the sources, cycling speciation, fate as well as human and ecosystem effects. The chapters are written by leading experts in their fields and the transdisciplinary volume provides an integrated account of current knowledge on one of the most enigmatic metals known to mankind. The authors have been asked to focus on general principles of thallium behaviour rather than on systematic compilation of published data. The volume should thus be of interest to graduate students and practicing scientists in the fields of environmental science and engineering, toxicology, public health, and environmental control. More importantly, it is addressed to everyone who is concerned about the impact of metallic pollutants on our health and our life support system.

METALS IN SURFACE WATERS, edited by H.E. Allen, A.W. Garrison and G.W. Luther, 262 pages, Ann Arbor Press, Michigan, USA (1998). ISBN 1-57504-087-5, £39.95

This is the fifth compilation of contributions on metal speciation and contamination made by the first author (H.E. Allen). The previous ones were on *Metal speciation: Theory, analysis and application* (Lewis Pub. 1988), *Metals in groundwater* (Lewis Pub. 1993), *Metal speciation and contamination of soil* (Lewis Pub. 1994) and *Metal continued aquatic sediments* (Ann Arbor, 1995). The present one is devoted to surface waters and is organized in four sections, covering:

- a. the sources of metals to surface waters, with particular reference to estuaries, using the Delaware Bay as an example, to urban runoff, with consideration of the particle size distribution, and to industrial discharges.
- b. the development of the background information necessary for the regulation of metal discharges, exploring approaches to waste load allocations for metals and discussing the development of site-specific copper criteria for the New York Jersey Harbor.
- c. the analytical methods for metals, discussing the importance of "clean" methods to water quality measurements and the use of cathodic stripping voltametry and plasma mass spectrometry for metal speciation.
- d. the binding of metals to heterogenous surfaces and dissolved humic substances, dealing extensively with the different modeling approaches.

As it can be seen, a variety of topics, including many case studies, that will provide the reader with more insight into the aquatic chemistry of metals and the information required for their regulation.

QUALITY AND TREATMENT OF DRINKING WATER, II, edited by J. Hrubec, 180 pages, Springer-Verlag, Berlin (1998). ISBN 3-540-62574-7. DM 198.00

This is vol. 5C of *The Handbook of Environmental Chemistry* series and the second devoted to the subject of drinking water (Vol. 5B was published in 1995 in the same series).

This new volume discusses in an authoritative way the current key issues of drinking water quality and its control: –Toxicity tests for assessing drinking water quality – Toxicological approaches for developing drinking water standards –Analysis of organic micropollutants – Algal toxins and human health – Quality changes due to application of ozone and chlorine dioxide. As it can be seen the book does not attempt to be an exhaustive review of this vast subject. For example, the classical topic of the reaction by-products of chlorination is not addressed, because it is covered in great detail in a number of other publications. In fact, the book is meant to give an overview of the development of key areas related to chemical contamination, with special attention to organic micropollutants. The articles are written by leading experts and present the state of the art of drinking water research.

This volume will therefore be a valuable source not only for scientists and engineers, but also for decision-makers in government, environmental control and industry.

ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY OF OXYGEN SPECIES, by I. Kruk, 262 pages, Springer-Verlag, Berlin (1998). ISBN 3-540-61983-6. DM 168.00

This is vol. 2I, within the collection *The Handbook of Environmental Chemistry*, started in 1980, to present a reasonably uniform view of various aspects of the chemistry of the environment, the reactions and processes taking place in it and the hazard assessment of the most important groups of chemical compounds.

The present book describes the chemical structure and spectroscopic properties of toxic oxygen species, such as superoxide, hydroxyl and organic oxygen radicals, hydrogen peroxide and singlet oxygen. The volume also covers their sources and the biochemical, clinical and environmental aspects of their formation, as well as the methods of identification. The chemical reactivity of oxygen species with biologically important compounds, including cell and tissue mechanisms of protection against damage is also dealt with. Finally, emphasis is placed on the role of oxygen species in the formation of pollutants, namely acid rain in degradation of polymers and plant senescence processes.

The wide information given provides the basis for understanding the role of the oxygen species in environmental pollution and health hazards. It will constitute an appropriate material for advanced courses on environmental chemistry and toxicology.

J. Albaigés
CID.CSIC
Barcelona, Spain