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### Book Reviews

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## Book Reviews

HAZARDOUS METALS IN HUMAN TOXICOLOGY, edited by Dr. A. Vercruyssen, Department of Toxicology and Pharmacognosy, Vrije Universiteit Brussel, Belgium, EVALUATION OF ANALYTICAL METHODS IN BIOLOGICAL SYSTEMS, PART B, 337 pages (including a general part and an analytical part, 2 figures, 25 tables, references added to each chapter, and a subject index of five pages), linen, format 249 × 171 mm, ISSN 0-444-42207-2, Elsevier Science Publishers, Amsterdam and New York (1984), US\$73., Dfl. 190.

The monograph is the 4th Volume in Elsevier's Series "Techniques and Instrumentation in Analytical Chemistry", Part A dealing with analysis of biogenic amines. The coherent, well-balanced book will undoubtedly be a valuable source of reference for many scientists involved with the analysis of metals and the interpretation of those findings in human toxicology. The first-class 16 contributors considered also factors such as sample pre-treatment, digestion techniques, recoveries and losses, sample throughput, cost and automation.

In spite of the long histories of the use of metals and of human toxicology, our knowledge and understanding of the fate of metals in the human body and their potential biological effects is still fragmentary. Fortunately, the last two decades have seen major developments and innovations in analytical methodology. Many proposed techniques have however limitations and pitfalls, and a critical review and evaluation is thus necessary, since reliable analytical data are a prerequisite for correct interpretation. For the latter purpose it was also found necessary to relate analytical data to other biological or physiological findings to put them into perspective with regard to health and disease states. The book thus deals also with

the toxicokinetics and dynamics of metals, distribution and elimination, biological changes, symptomatology, etc. Thus the information presented allow scientists faced with particular analytical problems to make objective assessments of methodologies open to him, but they give also a good basis for scientists in many disciplines to get a better understanding of the present possibilities of analytical chemistry. Perhaps a certain limitation must be made, because not too much is said about speciation—except for a small—but excellent—contribution about species separation, identification and quantification in a subsection. In the future one should really differentiate between metal compounds (and metal ions), and not just between metals.

The book is well structured into 11 chapters. The first three give the general background on human toxicology of metals, on biological effects (especially in blood, urine and hair) and their monitoring and on instrumentation (with an excellent overview of possibilities to achieve meaningful data of trace element concentrations in biological materials). The other eight chapters (structured comparably) inform about the analytical chemistry of lead, mercury, cadmium, arsenic, thallium, chromium, nickel, selenium and tellurium. Sampling, standard methods proposed, reference values and reference materials are individually discussed.

E. MERIAN

**THE HANDBOOK OF ENVIRONMENTAL CHEMISTRY, PARTS C**, edited by Prof. Dr. Otto Hutzinger, Chair of Ecological Chemistry and Geochemistry, D-850 Bayreuth, linen, format 243 × 170 mm, Springer-Verlag Berlin Heidelberg New York Tokyo (1984).

We have already earlier informed about Parts A (published 1980) and Parts B (published 1982) of this excellent handbook. From Part C Volume 1 and Volume 3 are now also available.

*Volume 1* "The Natural Environment and the Biogeochemical Cycles, Part C" contains 220 pages (including 6 tables, 55 figures, references added to each contribution, and a subject index of 4 pages), ISBN 3-540-13226-0, DM 124., US\$ approx. 46.30

*Volume 3* "Anthropogenic Compounds, Part C" contains 220 pages (including 62 tables, 31 figures, references added to each contri-

bution, and a subject index of 6 pages), ISBN 3-540-13019-5, DM 138., US\$ approx. 51.50.

As the experienced editor writes in the preface, environmental chemistry is a relatively young science, and a major purpose of the series is to present a reasonably uniform view of various aspects of the chemistry of the environment and chemical reactions occurring in the environment. The Handbook aids understanding about distribution and equilibria between environmental compartments, and about reactions, pathways, thermodynamics and kinetics. In risk assessment science contributes in the area of toxicology and in the area of chemical exposure. Labory test methods, mathematical correlations and models help to predict the environmental fate of (new) chemical compounds. The two volumes are thus again interesting to graduate students and to practising scientists in many fields, which should be discussed in a interdisciplinary way.

Volume 1, Part C is divided into 6 chapters:

- Humic Substances (Structural Aspects, and Photophysical, Photochemical and Free Radical Substances): The contribution characterizes humic acids, fulvic acids and humins from various soils, peats, coals, oil fields and volcanic ashes (for interactions of humic substances with environmental chemicals see Volume 2, Part B; production of haloforms in the environment is not covered).
- Organic Material in Sea Water (Analytical Methods, Distributions, Sources, Sinks and Cycles of Organic Carbon in the Sea).
- Marine Gelbstoff (composed of fulvic and humic components, and responsible for some coloration in seawater, but playing also a role in maintaining environmental balanced conditions between organic and inorganic traces).
- The Surface of the Ocean (dealing especially with composition, origin and characterisation of surface films, having eventually geochemical impact).
- Atmospheric Nitrogen: Chemistry, Nitrification, Denitrification and their Interrelationships (this contribution is a supplement to the chapter "The Nitrogen Cycle" in Volume 1, Part B, and summarizes abiological dinitrogen fixation processes).
- Carbon Dioxide: A Biogeochemical Portrait (this is the largest contribution in the volume, and is a supplement to the chapters

“The Carbon Cycle” and “Radiation and Energy Transport in the Earth Atmosphere System” in Volume 1, Part B, and covers especially the transfer from one environmental compartment to another and chemical interactions with bio- and geosystems.

Volume 3, Part C is divided into 4 excellent chapters:

- Aromatic Amines (this group of intermediates is quite important, also since quite a few industrial products may be decomposed into amines in the environment; information about production, use metabolism, toxicity, occurrence and reactions is presented).
- Phosphate Esters: the author deals with production, use, chemistry, analytical methods, environmental fate, pharmacokinetics, metabolism, and biological effects (these esters are widely used for industrial and consumer products, especially as fire retardant plasticizers and as high temperature functional fluids, and can thus get finally into the environment).
- Phthalate Esters (the chapter about these widely used plasticizers is similarly structured to the previous one, which makes comparisons easy).
- Thallium (a well balanced addition to the earlier series on heavy metals).

E. MERIAN

ENCYCLOPAEDIA OF OCCUPATIONAL HEALTH AND SAFETY, Third Revised Edition, edited by Dr. Luigi Parmeggiani, International Labour Office Geneva, two volumes A–K and L–Z, 2538 pages (including many colour plates, illustrations and diagrams, 9 appendices, a list of authors with addresses of 24 pages, and an index of 92 pages), linen, 304 × 226 mm, ISBN 92-2-103289-2, International Labour Office, CH-1211 Geneva 22 (1983), Sw. Fr. 275., US\$155., £78.

More than 1000 authors from the ILO's member States and over 15 specialised international organisations have participated to create this indispensable reference work (not only for those protecting workers' safety and health, but for all those scientists and administrators dealing with risk assessment with chemical substances) with 1150 articles (ordering alphabetically). The entries include chemical substances, and descriptors for materials, detection and analysis,

toxicology, human target organs, safety, ergonomics, physiology, psychology, etc. The chemical compounds are presented in a comparable way, because they start with characteristic properties, followed by information on production, use and occurrence, then on toxicity, other effects and hazards, then safety and health measures (including treatment), eventually data on acceptable daily intake, threshold limit values and disposal, and finally recent relevant literature. Each article of the second edition has been revised, and about 200 new articles have been added (especially related to hygiene, cancer, agricultural safety, etc.) The Encyclopaedia thus coordinates information on exposure, on accidents, on illness and on preventive measures (for instance also on dioxins and metals).

In the nine practical appendices the reader finds basic data on the elements, conversion tables, units of measurement and definitions, ILO-recommendations, references to selected international bibliographies, to evaluation of heat stress and to air pollution control equipment, and TLVs for chemical substances and physical agents (time weighted average and short term exposure limit values (ACGIH)).

E. MERIAN

**FIBROUS DUSTS—MEASUREMENT, EFFECTS, PREVENTION** (mostly in German, some summaries in French, 19 contributions in English especially on measurement and characterization of airborne asbestos, on filtering, on epidemiological findings and on tumour risk assessment), edited by Dr. Reinisch *et al.*, VDI-Report Nr. 475, 555 pages (including 404 figures, 138 tables, references added to the contribution, but no index), stiff paper cover, format 297 × 210 mm, ISBN 3-18-090475-5, Verlag des Vereins Deutscher Ingenieure, D-4000 Düsseldorf 1 (1983), DM 298.

The excellent proceedings for those interested in this special field of air hygiene summarize the results of a Congress organized by VDI, APPA and CITEPA, having taken place from the 4th to the 8th October 1982 in Strasbourg, France. The volume is structured into nine chapters: Techniques for Fibre Measurement/Results of Ambient Air Measurements/Epidemiologic Findings/Effect-related Experimental Results/Risk Assessment/Emission Sources/Emission Control/Substitution of Potentially Noxious Fibres/Synopsis of the

Results of the Conference. An introduction was presented by Prof. Dr. Hans-Werner Schlipkötter, Medical Institute for Environmental Hygiene, D-4000 Düsseldorf. The 76 contributions include the newest state of knowledge, and give thus a logic and complete overview. Each chapter ends with the valuable results of the discussions. The interdisciplinary debate on measurement techniques (number of fibres with carcinogenic potency should not be larger than 100–1000/m<sup>3</sup>), effects and measures for remedy lead also to improvements for a new VDI-Gideline for air pollution prevention, which should increase objectivity in measuring and interpreting.

E. MERIAN