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Book Reviews

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Book Reviews

ANALYTICAL CHEMISTRY OF MOLYBDENUM by Gordon A. Parker, Department of Chemistry, University of Toledo, Ohio 43606, USA, 175 pages (including 45 tables, valuable references added to each chapter, an author index of two pages, and a subject index of three pages), cloth cover, format 248 × 172 mm, Springer-Verlag Berlin-Heidelberg-New York-Tokyo (1983), ISBN 3-540-12235-4, DM 98.00, or approx. US\$ 40.50

Molybdenum and its compounds is of growing interest in industry and in life process sciences, and accurate and precise analytical methods are thus needed to determine presence and concentrations in a variety of samples. For the environmental chemist and the environmental biologist it is important to differentiate between very low levels (because molybdenum is essential for plants, animals and men, controls in blood and other biological materials are important) and toxic levels (enzymatic reactions, interaction with other element, especially with copper in the case of ruminants). The book proceeds in two parts.

Technical Procedures:

- Detection
- Separations
- Gravimetric Methods
- Titrimetric Methods
- Colorimetric Methods
- Emission Spectroscopy
- Atomic Absorption Spectrometry
- X-Ray Fluorescence
- Voltammetry
- Catalytic Methods
- Radiochemical and Activation Methods

Molybdenum in Specific Materials:

- Rocks and Mineral Samples
- Molybdenum and Molybdenum Based Alloys

- Molybdenum in Ferrous Alloys
- Molybdenum in Non-Ferrous Alloys
- Molybdenum Compounds
- Animal, Plant, and Soil Samples
- Environmental Samples
- Miscellaneous Samples

Extensive tables accompany the relevant chapters. The readers learn to select the appropriate analytical technique based upon available equipment, operator experience, and sensitivity required. It is also explained how knowledge in molybdenum chemistry helps to improve analysis, and to understand results.

ERNEST MERIAN

SELENIUM, A POTENTIAL ENVIRONMENTAL POISON AND A NECESSARY FOOD CONSTITUENT by Prof. Dr. Charles G. Wilber, Forensic Science Laboratory, Colorado State University, Fort Collins, USA, 126 pages (including 41 tables, 14 pages of valuable literature references (unfortunately practically no information about European scientific literature, such as from the selenium experts Brätter, Diplock, Glover, Parizek, Schelenz, Tölg, or from I.L.O. and W.H.O.), and 4 pages of a subject index), linen, format 236 × 162, ISBN 0-398-04858-4, Charles C Thomas Publishers, Springfield, Illinois 62717, USA (1983), US\$ 19.50

In the chapters Chemistry of Selenium (incl. Selenium Analysis; polarographic and voltammetric methods are however not discussed), Selenium in Soil, Water, and Plants, Selenium in Animals, Selenium in Man, Selenium as an Environmental Pollutant (mainly coal and heavy industry are mentioned as sources; not too much is said about newer wastes, e.g. from use of selenium compounds in information techniques), and Conclusion Remarks, and in an appendix with tabular data on selenium the reader finds a lot of crucial information. It is thus more than a short introduction to the biology and toxicology of this fascinating element (as written modestly in the preface). In fact selenium compounds with their relatively small range between deficiency and toxicity are of growing interest, and also nutritional implications, protective action, and

interaction are discussed to some extent. There are however a few gaps which are not treated according to newest international scientific knowledge: Almost nothing is said about speciation (in a new edition adequate information about organoselenium compounds should be presented too), which is so important in analytical chemistry and in environmental chemistry, and to understand differences of effects. One misses also results and interpretation about epidemiological studies in China, in Finland and in Venezuela, studies of populations with selenium deficiency and of populations with selenium overdoses. Also some total diet studies are of interest in this respect.

ERNEST MERIAN

BIOLOGICAL AND ENVIRONMENTAL ASPECTS OF CHROMIUM, TOPICS IN ENVIRONMENTAL HEALTH 5, by Sverre Langård, Porsgrunn, Norway, 285 pages (including an Introduction by Walter Mertz, Beltsville, MD, 28 figures, 62 tables, a subject index of 9 pages, and up to date references added to each chapter), linen, format 246 × 171, ISBN 0-444-80441-2, Elsevier Biomedical Press Amsterdam-New York-Oxford (1982), Dfl. 200.00, or US\$ 85.

The excellent compendium written by 12 scientific experts in the field is structured into ten chapters: Chromium compounds: Production and occupational exposure/Chromium in air, soil and natural waters/Analysis of chromium/Applications of ⁵¹Chromium in cell biology and medicine/The nutritional role of chromium/Absorption, transport and excretion of chromium in man and animals/Mutagenic and cytogenetic effects of chromium compounds/Organ toxicity of chromium in animals/Carcinogenic effects of chromium/The effects of chromium on the skin. The volume thus provides a comprehensive review of the present knowledge on environmental aspects of chromium and its compounds (only the effects of chromium compounds on aquatic organisms are missing), including the physiological role, mutagenicity, carcinogenicity, toxicity and metabolism in man and animals. Methods for analysis of chromium in biological fluids (also a very good chapter, dealing with the errors of most of

the published values) and environmental samples, and uses of the element in industry are major subjects of this book. The book is needed by scientists in cancer and mutagenicity research, environmental toxicologists, physicians in occupational medicine and health, industrial hygienists in the chemical industry, analytical chemists and laboratory clinicians. Throughout the book, the authors distinguish well between different chemical and physical forms (speciation), which illustrates an excellent interdisciplinary approach of chemically and biologically thinking scientists.

ERNEST MERIAN

ACID PRECIPITATION—ORIGIN AND EFFECTS, VDI-BERICHT 500 (in English and German), Proceedings on an International Colloquium in Lindau in June 1983, 434 pages (including 423 figures, 117 tables, no index, literature added to each chapter, and last but not least discussion remarks and valuable conclusions), stiff paper cover, format 297 × 209, ISBN 3-18-090500-X, VDI-Verlag GmbH, Düsseldorf (1983), DM 236.00

ACID PRECIPITATION—BIBLIOGRAPHY 1980–1983, by Ingrid Burkhardt (in English and German), prepared for the Lindau Colloquium, June 1983, 113 pages (including 526 literature references with short reproduced abstracts) and 7 pages of an author index), stiff paper cover, format 292 × 209, VDI-Verlag GmbH, Düsseldorf (1983), DM 25.00.

ACID PRECIPITATION—Genesis and Effects on Terrestrial Ecosystems, by Dr. B. Prinz, Essen, et al. (in German), 277 pages (with conclusions of a working group), 47 figures, 51 tables (including appendix), no index, but 29 pages with complete literature references), stiff paper cover, format 210 × 148 mm, VDI-Verlag GmbH, Düsseldorf (1983), DM 62.00.

All scientists and administrators active in this new area of research and of decision making should have these three volumes at hand with all the basic information available. As is well known the VDI-Verlag publishes also VDI-guidelines with maximum immission

values referring to human health (for instance VDI 2310, Suppl. 12, 1984 deals with concentrations for nitrogen dioxide). The colloquium proceedings are structured into the sections Emissions of Precursors, Transformations in the Atmosphere, Atmospheric Dispersion and Transport, Dry Deposition, Measuring Techniques and Results, Effects on Vegetation, on Soil, on Aquatic Ecosystems, and on Materials. Perhaps all the questions are treated somewhat too technocratically, that is to say what could be done to correct the situations (especially with SO₂ emissions, which is only one factor), rather than to discuss the causes for damages and to discuss interactions in an interdisciplinary way. But it gets much clearer where the gaps of knowledge are in effects on land organisms, in biological reasons for effects on fish, in mechanisms in plants (peroxides, polluted mist, magnesium, etc.), and in effects on historic buildings and on metal constructions.

ERNEST MERIAN

COMPREHENSIVE ANALYTICAL CHEMISTRY Vol. XVII, GAS AND LIQUID ANALYZERS, J. Vana, Research Institute for Organic Synthesis, Pardubice, Czechoslovakia. 774 pages, ISBN 0-444-99691-5, Elsevier Scientific Publishing Company, Amsterdam and New York, 1983, Dfl. 400.00, US\$170.25.

The aim of this volume of the series is to provide works of reference on the different techniques in analytical chemistry sufficiently complete to be used directly not only by professional analytical chemists but also to all those who are concerned with problems of analysis in other fields.

The important development in recent years in the analysis of environment and medical diagnosis has called for more and more sophisticated automatic analytical techniques. The book under review therefore deals with the present state of art in this field. It gives a fairly complete review of the currently used techniques with a theoretical background for each method. The application of these techniques together with the problems encountered are well described, particularly in different environmental media (water, atmosphere).

The interesting feature of this book, is that it includes techniques which are little known to analytical chemists. The layout of the book is according to the techniques used (density, potentiometry, chromatography, etc.). The final chapter included examples of application. A list of references is given at the end of each chapter; unfortunately, however, most of these are outdated. This book is particularly intended for those working in control laboratories, both chemists and technicians. Nevertheless, it is also of interest to analytical chemists in general as it contains information on many techniques which are rarely met in the analytical laboratories (density, thermal conductivity, magnetic susceptibility...).

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