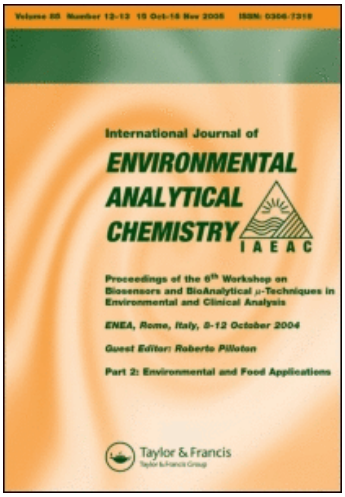

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Book Review

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Book Reviews

ATMOSPHERIC POLLUTION 1980, Proceedings of the 14th International Colloquium, Paris, France, May 1980, Monograph 8 of Studies in Environmental Science, edited by Michel M. Benarie, National Institute of Applied Chemical Research, Vert-le-Petit, France. 440 pages (including an author index of $1\frac{1}{2}$ pages, but no subject index), 188 figures, 47 tables and many equations, literature references are included in each chapter, linen, format 250 × 173 mm, ISBN 0 444 41889 X, published 1980 by Elsevier Scientific Publishing Company, P.O. Box 330, Amsterdam. U.S. $73.25, Dfl. 150.00.

This volume comprises a selection of 61 of the 81 papers presented at the 14th International Colloquium on Atmospheric Pollution, UNESCO, Paris, France, May 5–8, 1980. These papers are arranged into nine chapters:

Modeling

Airflow and Dispersion, Gaussian Plume

Analog Modeling

Pollution Formation, Transformation and Transport

Computations and Statistical Representations

Air Chemistry and Formation of Particulate Matter

Aerosol Physics and Measurement Concerning the Suspended Particulate Matter

Monitoring Networks and Survey Results

Effects on Man and on Vegetation

The idea of the two yearly colloquia and proceedings is to inform extremely fast about newest research results and concepts. In more than half of the book in the first six chapters 36 authors (11 from the U.S.A., five each from the U.K. and Germany, three each from France and Belgium) deal with the formation, the dispersion and the transportation of the important pollutants—such as SO_2, NO_x, O_3, steam and some trace metals (Fe, Pb, Zn, Mn, V, Ti, Ni, Cu, Cr)—and the improvement of mathematical models, taking into account influences of wind and turbulance.

In the two largest chapters 21 authors (nine from France) are discussing aerosol physics, measurement concerning suspended particulate matter, monitoring networks and survey results. Air sampling, measurement of particle size distribution, characterization of soot aerosols, analysis by optical microscopy and monitoring networks (for instance for SO_4'', SO_2, CH_2O and nitrosamines) have been developed further, also in view of monitoring of air pollution from industrial sources. Useful instruments and methods described are impactors, continuous flow condensation nuclei counters, laser spectroscopy, thermal energy analysis and piezoelectric particle mass monitors.

The book finishes with four papers about effects, which were however chosen somewhat arbitrarily, and are also very general. Three of them are nevertheless of interest, because they deal with the contamination and accumulation in plants. The results are valuable in relation to biological indicators and to the use as food. Mainly heavy metals from industrial emissions or from vehicle exhausts are discussed in relation to effect on plants. Patterns of fluoride accumulation in boreal forest species under perennial exposure to emissions from a phosphorus plant were also mentioned.

ERNEST MERIAN

TRACE CHEMISTRY OF AQUEOUS SOLUTIONS (General Chemistry and Radiochemistry), Monograph 18 of Topics in Inorganic and General Chemistry, by P. Benes and V. Majer, Czechoslovak Academy of Sciences, 252 pages (including 1006 literature references on 23 pages and a subject index of 7 pages), 61 figures and 38 tables, linen, format 246 × 175 mm, ISBN 0 444 99798 9, published 1980 by Elsevier Scientific Publishing Company, P.O. Box 330, Amsterdam, U.S. $56.00, Dfl 115.00.

Chemistry of Traces is presented as an independent discipline. It is summarized, generalized and theoretically explained, and especially information on differences in the behaviour of substances at very low concentrations (less than 10^{-5} Mols) are given. The treatment is limited to aqueous systems, excluding the electrochemical behaviour of traces of substances. Methods used for studying the physico-chemical properties of trace concentrations—especially radio methods (data concerning radionucleides as trace substances)—are discussed. The book is mainly dealing with traces in concentrations where they are generally invisible and which cannot be precipitated anymore. In these very low

concentrations almost all the elements are always present, also in accordance with their individual properties. This omnipresence of stable isotopes has to be kept in mind, when dealing with radiochemistry of traces. It is however possible to differentiate between homogenous and heterogenous (microheterogenous and macroheterogenous) systems, that is to say between solid phase-liquid, solid phase-gas, liquid-liquid and liquid-gas systems.

One chapter of 99 pages deals with traces in homogenous and microheterogenous aqueous systems with the ionic or molecular state of traces and with the colloid state of traces, including the factors which influence the formation and properties. Methods for preconcentration and determination and their theory are generally reviewed. Two tables of 14 pages sum up existing trace colloids and criteria and features, that can be used for estimation of the nature of trace colloids.

The other chapter of 90 pages deals with traces in macroheterogenous systems (aqueous solution—solid phase). It is subdivided into three parts:

Nature, Classification and Importance

Distribution of Traces between Solution and a Solid Phase in State Nascendi

Distribution of Traces between a Solution and a Preformed Solid Phase.

In this chapter mainly precipitation and sorption are discussed, and the factors influencing them. The kinetics of the physical-chemical reactions are explained. But in spite of the title little information is given about analytical chemistry of traces and radiochemistry, and throughout the book traces are meant to be inorganic traces, especially in the form of ions. The monography can however be recommended to those interested in the background of microchemistry.

ERNEST MERIAN

LUFTVERUNREINIGUNG DURCH POLYCYCLISCHE AROMATISCHE KOHLENWASSERSTOFFE—ERFASSUNG UND BEWERTUNG (Air Pollution by Polycyclic Aromatic Hydrocarbons), VDI-Bericht 358 in German and in English by the Verein Deutscher Ingenieure, Postfach 1139, D-4000 Düsseldorf 1. 422 pages (including many figures and tables, but no subject index), stiff paper cover, format 297 × 210 mm, ISBN 3 18 090358 9, printed and available from the VDI-Verlag GmbH, Abt. VW, D-4000 Düsseldorf, August 1980, DM 198.00.

Annex: Bibliography 1975–1979 "Polycyclic Aromatic Hydrocarbons" with more than 1000 Abstracts, 356 pages, ISBN 3 18 419062 5, also printed and available from the VDI-Verlag GmbH, 1979, DM. 97.00.

The important and up to date volume—which can be highly recommended—gives the result of an interdisciplinary colloquium, which took place in Hannover, Federal Republic of Germany in September 1979. It was the purpose to establish the knowledge about the analytical chemistry, the environmental fate (sources, emissions, local concentrations) and the effects of this group of chemicals. It was especially discussed to what extent these polycyclic aromatic hydrocarbons are responsible for the increase of lung cancer. The 52 authors (40 from Germany, 4 from the United Kingdom, 4 from the U.S.A., 2 from France, 1 from The Netherlands and 1 from Norway) were able to evaluate and interpret the state of the art and could take some final conclusions.

The volume is divided into 7 chapters with German or English papers:

Introduction and Plenary Papers about Measurement

Methods and Results of PAH-Emission-Measurement

Methods and Results of PAH-Concentration-Measurement

PAH-Epidemiology

Chemical Carcinogenesis: Biochemistry and Short-Term Tests

Long-Term Tests

Closing Remarks (Conclusions)

Most of the chapters contain valuable and thorough summaries in German and English. Especially the concluding remarks about "Present-Day Situation and Future Aspects of PAH-Measurements" by Dr. M. Buck, D-4300 Essen 1, about "Problems Involved in Finding an Exposure Limit for Polycyclic Aromatic Hydrocarbons" by Dr. F. Pott and Dr. R. Dolgner, D-4000 Düsseldorf 1, about "The Concept of the German Guiding Rule VDI 2310 about Maximal Concentration Values of Carcinogenic Substances" by Dr. B. Prinz, D-4300 Essen-Bredeney and the summary by Prof. Dr. H.-W. Schlipköter, D-4000 Düsseldorf 1, who formulated the result of the colloquium, are of great value. The latter stated that the development of the analytical chemistry of the PAH is justified by their relevant carcinogenic effects. The fact that we don't know enough about epidemiologic relationships and about the long incubation times for these compounds does not justify to wait for further results. It is suggested that as a precaution a maximum concentration limit of 10 ng Benzo(a)pyrene/m^3 air is fixed. This pragmatic approach can be improved later with better knowledge, for instance also by consideration of the

changing PAH-profile. Since there is no zero-risk, the concentration load should be kept as small as possible.

The measurement techniques deal with investigations of the mechanisms of formation of PAH, methodical investigations for the determination of optimal boundary conditions for sampling and analysis of PAH, emission measurements, air pollution concentration measurements and preparation of PAH samples. For the final analytical step two methods are used: Gas chromatography with capillary columns and high-performance liquid chromatography. The first one is preferable for multicomponent determination, whereas the latter has advantages for routine measurements of the small number of relevant PAF for large numbers of samples. To improve capabilities of quantitative descriptions calibration of the procedures and interlaboratory tests are necessary. Optimal sampling times for mobile measurements should be within the range of hours. Connections between ambient PAH concentrations and PAH-emission sources (cause analysis, fingerprints) are determined. The most important factors for PAH automotive emissions are those related directly to the engine. They can be decreased by running on lean mixtures. Concerning air pollution measurements a tolerably clear picture about the temporal and spatial patterns of PAH pollution is necessary. Special problems are involved with PAH measurements in precipitated dusts and soil.

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