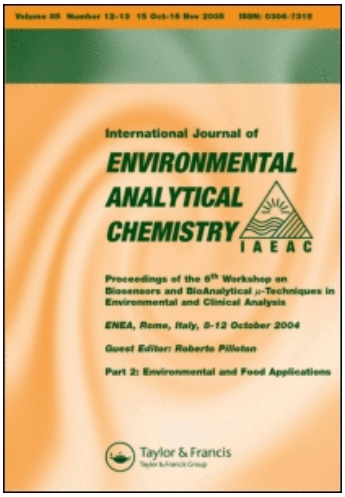

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Book Reviews

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Book Reviews

AIR POLLUTION BY PHOTOCHEMICAL OXIDANTS (FORMATION, TRANSPORT. CONTROL, AND EFFECTS ON PLANTS), Monograph 52 of Ecological Studies, edited by Dr. Robert Guderian, Institute for Applied Botany, D-4300 Essen, 346 pages (including 54 figures, 49 tables, references (in two parts) of 52 pages, and a good subject index of 12 pages), hard cover, format 248 × 173 mm, ISBN 3-540-13966-4, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo (1985), DM 158.

This is the up-to-date information for all those interested in photochemical oxidants, and their effects (for instance to understand forest damages). The excellent presentation is divided into two parts "Formation, Transport, and Control of Photochemical Oxidants" and "Effects of Photochemical Oxidants on Plants". In the first part emphasis is layed on oxidants, precursors, and concomitant species (perhaps more should be said about hydrogen peroxide in clouds and fog droplets in a new edition), on air chemistry and dispersion (including simulation and models), and on surveillance of ambient air quality (also here hydrogen peroxide should be discussed, which is probably the most active ingredient in liquid phases). The most often used methods for measurements of oxidants (and their precursors) are described, without however dealing with sampling problems. In a short chapter on abatement strategies, it is stressed that unfortunately knowledge on quantitative correlations between ozone maxima and other precursor and oxidant concentrations in the atmosphere is not yet adequate.

In part II five subchapters inform on mode of action, on diagnosis, surveillance and estimation of effects, on factors influencing plant-responses, on effects of pollutant combination, and on dose-response

relationships. In the very complete review also very important questions are discussed adequately, such as species, cultivar and individual plant resistance (oaks are categorized as an intermediate species, beech as a less sensitive species, in spite of the fact that these trees are also damaged within forests nowadays), combination effects of ozone and sulfur dioxide, some observations of synergistic effects of cadmium on ozone injury and chlorophyll loss, and attempts to propose maximum acceptable ozone concentration (the difference between clearly phytotoxic ozone concentration and the natural ozone background is said to be small, and it seems that resistance increases with concentrations of natural ozone background). A special subchapter 2.5.5 discusses already on 13 pages "ozone, sulfur dioxide, and acid precipitation—the cause of forest decline in central Europe?" It is concluded that better information concerning combined effects is needed (including better understanding of nutrient deficiency and aluminium phytotoxicity).

ERNEST MERIAN

RESPONSES OF MARINE ORGANISMS TO POLLUTANTS, edited by John J. Stegman (Woods Hole Oceanographic Institution, Woods Hole, Massachusetts, U.S.A.) and G. W. Heath (Senior Editor of the journal, Marine Environmental Research, U.K.), 547 pages (including 141 figures, 75 tables, references added to the contributions, and a subject index of seven pages), linen, format 249 × 176 mm, ISBN 0-85334-275-X, Elsevier Applied Science Publishers Ltd., Barking, Essex IG11 0SA, England (1984), £88.

This important book is devoted to the recognition and understanding of the cellular and subcellular responses of aquatic animals to toxic chemicals, and thus establishes the basis for waterborne pollutant effects, and provides appropriate tests to monitor biological change in the environment. The volume is based on papers presented at the Second International Symposium on Responses of Marine Organisms to Pollutants, held at Woods Hole Oceanographic Institution, Massachusetts in April 1983. It contains 87 contributions, mainly from U.S.A. scientists, but also from Canada, Great Britain, Sweden, and sporadicly from other European and Australian countries. The book is structured into four chapters according to the sessions which have taken place:

—Cytochromes P-450 and Biotransformation
—Metals and Metal-Binding Proteins
—Biochemistry, Physiology and Bioassay
—Immunology and Pathology.

This classification makes it perhaps somewhat difficult to find papers of interest. About a dozen contributions deal with metabolism, distribution and interactions of petroleum-hydrocarbons and of aryl-hydrocarbons. Another dozen is oriented to metabolism, distribution and interactions of chlorinated compounds, such as PCB's, HCB, PCP and chlorinated pesticides. About a further dozen contributions discuss accumulation, metabolism and interactions of cadmium, and more than another dozen covers metal up-take, distribution, metabolism and interactions (especially of copper and mercury species). Throughout the book one finds valuable information on biochemical reactions (especially on protein-binding), and on bio-indicating, which reactions may serve also to detect and to describe pathways of xenobiotic pollutants and their effects in fish, and other aquatic organisms. Also mutagenicity and interspecies differences are discussed, and of special interest are newest informations on fish and crab metallothioneins.

ERNEST MERIAN

COMBUSTION CHEMISTRY, edited by Dr. William C. Gardiner Jr. (Department of Chemistry, University of Texas at Austin, Texas 78712, U.S.A.), 509 pages (including 146 figures, 46 tables, many formulas, references added to each chapter, three appendices with programs and tables of coefficient sets, and a subject index of about 4 pages), linen, format 242 × 162 mm, ISBN 3-540-90063-X, Springer-Verlag, New York, Berlin, Heidelberg, Tokyo (1984), DM 176.

The title of the book may be somewhat misleading, because only a part of combustion chemistry (leaving out all secondary processes with pollutants, such as metal compounds, aromatic hydrocarbon compounds, or halogenated hydrocarbon compounds) is discussed, namely small-molecule combustion and model combustion processes on large computers. Based on physico-chemical data (especially on thermo-chemical data) the authors give the background for further progress in optimizing burner (especially with steady flames) perfor-

mance and reducing pollutant emission. Reactions of fuel molecules with at most only two carbon atoms, temperature dependence of rate coefficients, and nitrogen chemistry are studied in detail, whereas little is known yet about the chemistry of sulfur in flames, and for modelling still oversimplifications of the fluid dynamics or the chemistry are necessary. Apart from the introduction the book is structured into seven chapters:

—Computer Modelling of Combustion Reactions in Flowing Systems with Transport
—Biomolecular Reaction Rate Coefficients (Predictions, Comparisons to Experiments)
—Rate Coefficients of Thermal Dissociation, Isomerization, Recombination Reactions
—Rate Coefficients in the C/H/O System
—Survey of Rate Constants in the N/H/O System (Production of Nitrogen Oxides)
—Modeling (Mathematical Theory; Critical Statistical and Sensitivity Analysis)
—Thermochemical Data for Combustion Calculations (Property Estimation).

ERNEST MERIAN