Photosynthesis Energy Transduction

A Practical Approach

Edited by M.F. Hipkins and N.R. Baker

IRL Press; Oxford, 1986

xi + 199 pages. £25.00, $45.00 (hardback); £15.50, $28.00 (paperback)

This short paperback is a member of the 'practical approach series' published by IRL Press. It aims to describe the laboratory techniques most commonly used in the investigation of photosynthetic energy transduction, defined as those photosynthetic reactions leading to $NADP^+$ reduction and ADP photophosphorylation. On the whole, the book succeeds admirably. Chapter 2 gives excellent descriptions of the reagents and procedures necessary to isolate protoplasts, intact chloroplasts, thylakoids, and membrane complexes such as b_6-f, the PSII reaction centre and CF_0-CF_1. This is followed by a chapter on the electrophoretic analysis of pigment-protein complexes. This again is a useful compendium of techniques, although I cannot agree with the author that laboratory staff should need a computer programme (pp. 31–32) to perform a simple calculation of chlorophyll concentrations (explained on pp. 63–64). Chapter 4 is a very useful review of the principles of spectroscopy, containing reminders of several basic points essential to accurate spectrophotometric measurements. The next chapter gives very clear and detailed instructions on the setting up and use of oxygen electrodes for chloroplast experiments, and on performing redox titrations. Chapter 6 explains how photophosphorylation should be measured. Finally, there are two brief appendices, one of which is a useful note on the various ways of measuring radiant energy.

Overall, I enjoyed this book and it should provide a valuable laboratory manual. Its weakest feature is perhaps the introductory chapter (chapter 1), which reviews the photosynthetic electron transport system and photophosphorylation in a very condensed fashion. Such a review is probably unnecessary for most scientists who will use the book, who should understand this material to begin with. Also, chapter 1 overlaps with brief introductory reviews in the other chapters.

Overall, though, a very good book. I hope to see a similar book, dealing with the assay of chloroplast enzymes, in the near future.

B. Halliwell

Frontiers in Bioinorganic Chemistry

Edited by Antonio V. Xavier

VCH Verlagsgesellschaft; Weinheim, 1986

736 pages. DM 185.00, $92.50

The title reflects forgivable enthusiasm rather than the whole truth. The contents originate from the lectures given at the Second International Conference on Bioinorganic Chemistry held in April 1985 in the Algarve, Portugal, and the diversity of the 80 papers reflects current structural and func-

tional research accurately enough. Most, however, are progress reports of specific research rather than state-of-the-art reviews although sections by M.E. Farago (Metal Ions and Plants), R.J. Shamberger (Selenium Metabolism in Man and Animals) and R.J.P. Williams (The Inorganic Chemistry of Biominerals) are among the exceptions. The main emphasis is in the structural and mechanistic studies of metallo-proteins and bioinorganic complexes and the examination of models of metal-ion containing binding sites.

The book should certainly be carefully scrutinized by all those using the current basic spectroscopic techniques whether Mössbauer, EPR, NMR or EXAFS, and notably by those interested in the possibility of optical detection of paramagnetic resonance by magnetic circular dichroism (paper by Thomson, Barrett, Peterson and Greenwood). Iron, iron-sulphur and copper environments receive most attention but there are also a number of studies of nickel-containing proteins. There are only 3 reports on Mo and a similar number on nucleic acid-metal interactions, the latter including a disappointingly brief paper by the Eichhorn group on their influence on genetic information transfer.

While presented as an interdisciplinary survey the conference reports will be of much greater value to the chemist and less relevant to those mainly interested in environmental or clinical applications, despite the presence of an examination by Cross, Read, Smith and Williams of 'Plutonium Speciation from Disposal Vault to Man', a survey by Kolchuk on 'Clinical Disorders of Zinc Metabolism' and a good review 'Gold Drugs' by Berners-Price and Sadler.

J. Mason

Biohalogenation

Principles, Basic Roles and Applications

by S.L. Neidleman and J. Geigert

Ellis Horwood; Chichester, 1986

203 pages. £25.00

This monograph on biohalogenation is organised into a brief introduction (chapter 1), 7 main chapters, a short concluding chapter on future directions for biological halogenation, a bibliography and an index.

Chapter 2 gives a chemical description of halometabolites and their sources. One immediately has an impression of the scope of this area by the chemical diversity of halometabolites, and by deduction, the range of enzymes that elaborate these compounds. The sources of these metabolites are then amply documented by extensive lists and structures and detailed consideration is given to the role of bacteria, fungi, algae, higher plants and marine animals in the production of halometabolites.

Chapter 3 is concerned with an excellent description of the halogenating enzymes (haloperoxidases) and sub-classifies them as iodo-, bromo- and chloroperoxidases, and describes the reaction types which each of the enzymes catalyse. A useful section in this chapter outlines step-by-step protocols for the isolation and purification of chloroperoxidases, bromoperoxidases, myeloperoxidases, eosinophil peroxidase, bactoperoxidase, thyroid peroxidase and a listing of commercially available enzyme preparations. This latter section is coupled with detailed methodology on several assay systems currently used to detect and monitor enzyme activity. The chapter concludes with a compendium of in vitro haloperoxidase reactions, focussing on the reasons why these