rate CO_2 reduction under ambient conditions", and also look at metal reduction processes, but extend discussion to unusual surfaces, such as proton exchange membranes and catalysts possibly permitting electrochemical reduction of CO_2 in the gas phase. Finally, Lewis and Shreve explore the "Photochemical and photoelectrochemical reduction of carbon dioxide", using photosensitizers and/or semiconductors.

The research area described in this book is very active but many problems remain to be resolved. This book is a very useful contribution to the further development of the field.

Charge transfer photochemistry of coordination compounds, by O. Horváth and K.L. Stevenson, VCH, Weinheim, 1993, 380 pp., DM238. ISBN 1-56081-564-7.

Great effort has been expended in the design of photoactive coordination compounds, mainly in the direction of solar energy conversion. This book builds upon the early work by Balzani and Carassiti (*Photochemistry of coordination compounds*, Academic Press, 1970) to bring this field up to date.

The first three chapters in the book provide the fundamental theory for light absorption and emission, and a discussion of the nature of the various possible charge transfer states. These are presented in a brief and rather incomplete fashion, since there exist other texts which cover the theory in much greater depth. Then follow 10 chapters, each dealing with the photoinduced redox reactions of metal complexes, organized by groups across the Periodic Table. Extensive spectroscopic data are presented, showing the effect of light on various species (photolysis). Photoproducts and quantum yields are discussed in depth. The book is moderately comprehensive for all the metal systems, except that it only surveys the enormous field of ruthenium polypyridines. The book will make very interesting reading for anyone interested in inorganic photochemistry and is highly recommended.

There is a subject index, a materials index (list of metal complexes considered, also partially indexed by ligand) and an addendum of more recent relevant references not covered in the text.

Metal ions in biological systems, Vol. 29, *Biological properties of metal alkyl derivatives*, edited by H. Sigel and A. Sigel, Marcel Dekker, New York, 1993, 448 pp. ISBN 0-8247-9022-7.

This is volume 29 in a series which began in 1973 and which was devoted to the then nascent field of metal ions in biological systems. The series has

contributed in an important fashion to the development of the area and has brought together chemistry, biology, physics and medicine, to solve interdisciplinary problems in the area of living systems.

This volume deals exclusively with the biological effects of metal alkyls introduced into the biosphere, most accomplished via the action of microorganisms on the bottom of rivers, lakes, etc. Chapters deal with the "Global bioalkylation of the heavy elements" (Thayer); the "Analysis of organometallic compounds in the environment" (Mennie and Craig); the "Biochemistry of methylgermanium species in natural waters" (Lewis and Mayer); the "Biological properties of alkyltin compounds" (Arakawa and Wada); and of "Alkyl derivatives of lead" (Yamamura and Arai) and of "Selenium and tellurium" (Karlson and Frankenberger, Jr.); the "Metabolism of alkyl arsenic and antimony compounds" (Vahter and Marafante); the "Making and breaking the Co–alkyl bond in B_{12} derivatives" (Pratt); the "Methane formation by methanogenic bacteria: redox chemistry of coenzyme F430" (Jaun); the "Synthesis and degradation of organomercurials by bacteria" (the Editors); and the "Biogenesis and metabolic role of halomethanes in fungi and plants" (Harper).

Curiously, the element which is most associated in the lay mind with this field, i.e. mercury, does not have a detailed presentation. Unfortunately, the author responsible for this topic was unable to make his contribution and the editors, in the short "Organomercurial" chapter mentioned above, outline the reasons why, via excerpts from a fax received from the proposed contributor; they also provide a summary of recent pertinent references to benefit those who wish to know more.

The editors should be congratulated on bringing together a set of chapters which truly cover this broad field (aside from mercury!) in an intensive fashion.

Photosensitive metal–organic systems, mechanistic principles and applications, edited by C. Kutal and N. Serpone (ACS Advances in Chemistry Series, no. 238), American Chemical Society, Washington, DC, 1993, 448 pp., US$109.95. ISBN 0-8412-2527-3.

This volume is based on an ACS symposium that dealt with photosensitive metal–organic systems. Some 21 of the 23 symposium presentations are included in this book of refereed chapters. The chapters deal variously with the photochemistry, photo- and redox catalysis of inter alia tungsten, iron and ruthenium carbonyls, rhenium and molybdenum complexes, d^4 bimetallic systems, polyoxotungstates, metal carbynes, copper complexes, surface-