systems including polyphosphazenes, polysiloxanes, polysilanes and related polymers, and miscellaneous polymers containing sulphur, phosphorus, boron etc. The book presents a detailed overview of the subject and is a useful text for researchers in the field.

Progress in inorganic chemistry, edited by K.D. Karlin, Vol. 41, Wiley, New York, 1994, 848 pp., US$103.00. ISBN 0-471-59699-X.

In his first edited volume in this series, Kenneth Karlin has brought together an excellent group of authors. Nine chapters contain "X-ray crystallography; a fast, first resort analytical tool" (Håkon Hope), which details the practical aspects of collecting data and solving X-ray structures; the "Principles and applications of semiconductor photoelectrochemistry" (Nathan Lewis and coauthors), which is a very extensive and scholarly study of this field; "Chemical vapor deposition of metal-containing thin-film materials from organometallic chemistry" (James T. Spencer), which contains a very useful and extensive tabulation of the various species which can be deposited as thin films. Further chapters discuss the "Construction of small polynuclear complexes with trifunctional phosphine-based ligands as backbones" (Alan L. Balch), presenting a great deal of structural data; the "Chemistry of transition metal complexes containing catechol and semiquinone ligands" (Cortland G. Pierpont and Christopher W. Lange) brings up to date an earlier review by the senior author in 1981, dealing with these fascinating redox active ligands; a study of "Macrocyclic polyamine zinc(II) complexes as advanced models for zinc(II) enzymes" (Eichi Kimura); the "Chemistry of nickel-containing enzymes (Andrew F. Kolodziej), summarizing recent studies of nickel enzymes which have only recently been recognized. The final two chapters deal with the "Chemistry of peroxnitrites" (John O. Edwards and Robert C. Plumb), which explores a relatively underdeveloped area of main group chemistry, and "Metal chalkogenide cluster chemistry" (Ian Dance and Keith Fisher), with an extensive tabulation of the preparation and structures of the systems. Certainly, the high reputation of this series is maintained under the new Editorship.

Nanosystems, molecular machinery, manufacturing and computation, by K.E. Drexler, Wiley, New York, 1992. 556 pp., US$15.95. ISBN 0-471-57457-X.

The volume contains a series of chapters demonstrating how, in principle, molecular engineering can be used to design molecular-sized devices to accomplish a wide variation of tasks. It paints an exciting view of a future

where almost anything might be achieved with nano-sized machines. Think, for example, of the possibility of injecting nanomolecules into a human blood stream, designed to seek out a cancer and cut it out! The basic physics and chemistry are presented first, followed by the computational methods, the effects of statistical mechanics, quantum uncertainty, damage mechanisms, energy dissipation and the fundamentals of mechanosynthesis — an unusual subject which is likely to assume great importance in the future. The book essentially defines molecular nanotechnology. Appendices include symbols, units and constants, a glossary of terms and a subject index.

Electrochemical and electrocatalytic reactions of carbon dioxide, edited by B.P. Sullivan, K. Krist and H.E. Guard, Elsevier, Amsterdam, 1993, 298 pp., Dfl. 340 (about US$212.50). ISBN 0-444-88316-9.

The reduction of carbon dioxide to useful products is a major goal for humankind, after the plants have been achieving it for millions of years. It is also of importance to be able to recycle carbon dioxide in the atmosphere, possibly from fossil fuel stacks, converting it directly into useful products. This book explores the chemistry of carbon dioxide with these aims in mind.

A series of chapters focuses on the various aspects of this problem. Keene presents "Thermodynamic, kinetic, and product considerations in carbon dioxide reactivity" — a useful source of free energy and electrochemical potential information for the various processes of interest. Creutz discusses "Carbon dioxide binding to transition-metal centers", summarizing the complexes (known to 1991) with a theoretical description of the bonding involved. Ford presents "Catalysis of the water–gas shift reaction", which is an area of particular interest to this author. DuBois and coworkers explore "Electrochemical concentration of carbon dioxide". Here, the emphasis is on the possibility of using atmospheric carbon dioxide as the source of industrial gas in very large quantities and, hence, the need for its efficient concentration. The editors Keene and Sullivan tackle the "Mechanisms of the electrochemical reduction of carbon dioxide catalyzed by transition metal complexes". A careful assessment is presented of the myriad of possible reduction products which might be bound to a metal centre in a stable or transient intermediate state, and consideration is given to how the various possible reduction products might be attained. Frese, in a very extensive contribution, deals with "Electrochemical reduction of CO_2 at solid electrodes", which is a very useful survey of the energetics of reduction, and the product yields and distribution on a range of different electrode surfaces, both metallic and semiconductor. Sammells and Cook discuss "Electrocatalysis and novel electrodes for high