It seems to me that every chemistry library should have this book, especially those serving laboratories which might consider using bismuth organic compounds for organic synthesis.

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Metal Oxygen Clusters. The Surface and Catalytic Properties of Heteropoly Oxometalates. By *John B. Moffat*. Kluwer Academic Publishers, Dordrecht 2001. 320 pp., hardcover € 170.00.—ISBN 0-306-46507-8

Heteropolyoxometalates are of considerable interest as catalysts for acid–base and redox reactions, and consequently this field continues to be studied intensively. Thus the book *Metal Oxygen Clusters* by John B. Moffat deals with a subject that is certainly topical at this time. The work is divided into eleven chapters. Chapter 1 gives a short account of the historical development of research on oxometalates. Chapter 2 discusses the synthesis of these compounds, but without giving detailed information. Chapter 3 is concerned with the physical characterization of oxometalates, describing the various methods used, with the help of examples. However, it is surprising that there is no mention of such important methods as Raman spectroscopy and inductively coupled plasma (ICP) spectroscopy. The structure of oxometalates and their bulk properties are described in Chapter 4, then Chapter 5 deals at considerably greater length with how their stability is affected by temperature and pH. Oxometalates are often used in the form of supported catalysts, and Chapter 6 describes the preparation, characterization, and properties of such systems for a wide variety of support materials. Chapter 7 is concerned with microporosity, sorption, and diffusion in metal–oxygen clusters, and with cation exchange processes. Special attention is given to the origin of microporosity and its dependence on the nature of the counterion. Oxometalates possess acidic and redox properties, and accordingly Chapter 8 describes the study of their acidic properties by physical methods and reactivity tests. This chapter also contains a short section on redox properties. Two fairly long chapters are devoted to acid-catalyzed processes and oxidation reactions using oxometalates. The reactions discussed in Chapter 9 (acidic catalysis) are: conversion of methanol to hydrocarbons (MTG reaction), reactions of alcohols, conversion of alkanes into alkenes, alkylations and Friedel–Crafts reactions, ring enlargements, and ring contractions. Chapter 10 discusses oxidation reactions applied to alkanes, alkenes, methacrolein, and isobutyric acid. Chapter 11 concludes the book with a brief description of the use of oxometalates in environmentally relevant processes.

This book by J. B. Moffat gives a broad survey of the published work on oxometalates up to the beginning of year 2000. In a monograph dealing with a narrowly defined subject area the reader expects to find a critical evaluation of the published work, but unfortunately that is absent or only very limited here. Also none of the chapters ends with a summary or conclusions. Often there is a reference to other parts of the book, in a phrase such as "noted elsewhere", without giving a page or section number. There are instances of unnecessary repetition in the text or figures—for example, Figures 5.4, 5.5, and 5.6 are identical to Figures 3.1, 3.2, and 3.3 respectively. SI units are not always used. Energies are usually given in kcal mol^{-1}, and only occasionally in the preferred unit kJ mol^{-1}. Many other lapses could be listed. For example, in Section 6.1.2 we read "…TiO_2 in the form of titania…", and the catalytic activities observed for different catalysts are compared without specifying the quantities used and how they were normalized. In the stoichiometric equations on page 170:

$$H_2(g) \rightarrow 2H^+(ads)$$

and on page 171:

$$D_2(g) + H^+(s) \rightarrow 2D^+(ads)$$
$$+ H^+(s) \rightarrow HD(g) + D(s)$$

the charge balance is incorrect. Also the book is unfortunately not free of printing errors, of which I give here just one example:

$$D_2(g) + 2H(s) \rightleftharpoons H_2(g) + 2C(s).$$

The quality of the figures is not up to modern standards. The labeling is not consistent (upper and lower cases mixed), and sometimes different symbols are used for the same quantity, for example the pore radius in Figures 7.5 to 7.8. The list of contents is quite inadequate.

However, despite these shortcomings the book can be recommended as a good survey of the literature in the area of oxometalates research. It is not very suitable for newcomers to the field.

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Extraction of Metals from Soils and Waters. By *D. Max Roundhill*. (Series: Modern Inorganic Chemistry.) Kluwer Academic/Plenum Publishers, New York 2001. 375 pp., hardcover € 127.00.—ISBN 0-306-46722-4

With the publication of this book on the extraction of metals from soils and waters, at last we now have a work which reviews the current state of research and development in this area from the viewpoint of inorganic and coordination chemistry. This third book by Max Roundhill in the *Modern Inorganic Chemistry* series provides a thoroughly competent treatment which will serve the needs of both researchers and users of the methods. As well as having a logical and systematic structure, the text is written in an easily readable style so that the contents can be assimilated quickly. The clear arrangement of the material according to the different methods and heavy metals will ensure that the above

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