

Book reviews

Inorganic Reactions and Methods, Volume 1. The Formation of Bonds to Hydrogen (Part 2), ed. by J.J. Zuckerman, xxvi + 476 pages, VCH Publishers Inc., ISBN 0-89753-252-3, Deerfield Beach, Florida, 1987, DM 298.00

This volume arrived on my desk together with a notice of the death of Professor Zuckerman. It is sad to think that this innovative series will be deprived of his guidance, and one hopes that any successor as editor will be able to complete successfully what Professor Zuckerman has so ably started.

With this volume, the intent and the range of the original method of classification of inorganic reaction chemistry becomes clearer. In it are described the reactions of formation of bonds from hydrogen to the elements of Groups 1, 2, 13, 14, 15, and 18, and to transition elements and inner-transition elements, and the volume concludes with a discussion of the reversible reactions of dihydrogen to form metal hydrides.

As a test of the system, I elected at random to seek out the substance $[\text{HRu}_3(\text{CO})_{10}\text{NO}]$. This is found in the extensive formula index (ca. 150 pages) in its "normal" position $\text{C}_{10}\text{HNO}_{11}\text{Ru}_3$ (accompanied by the more explicit but non-IUPAC formulation $\text{HRu}_3(\text{CO})_{10}\text{NO}$) but also in permuted form under $\text{O}_{11}\text{Ru}_3\text{C}_{10}\text{HN}$ and $\text{Ru}_3\text{C}_{10}\text{HNO}_{11}$. The non-permuted formula refers not to a page but to 1.10.6.2.4, that is section 1 of the series organization (section 1 comprises 2 volumes), Chapter 10, subsection 6.2.4, which is found easily because the section and subsection details are at each page head. Within the specified section is a brief description of the protonation of $[\text{Ru}_3(\text{CO})_{10}(\text{NO})]^-$, and at the end, in close proximity, the required reference. There is a complete author index at the end of the volume.

The question of how complete or accurate is the material is not so easy to assess. I have reservations about the accuracy and presentation of some of the material concerning nitrogen fixation, but some unevenness is to be expected in a work involving so many authors. Some of the references are to reviews or even textbooks, when reference to the original literature would have been more appropriate. Compounds such as SiH_4 receive many references. However, for obvious reasons, organometallic derivatives such as Me_3SiH are treated less extensively.

In conclusion, this is likely to be an invaluable series. The compounds treated are easy to find, and it is clear that the main entrée will be via specific compounds rather than via reactions. It will be necessary to refer to the original literature for full details, and one may have to look further than this series to identify all the basic information. However, the series should be of value to many varieties of preparative chemist. Despite the editor's stated desire to eliminate the uninformative quotation

of named reactions from his text, it would not be inappropriate if the use of "Zuckerman" became general and widespread, and it is indeed likely.

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Spectroscopic Properties of Inorganic and Organometallic Compounds, Volume 19, edited G. Davidson and E.A.V. Ebsworth, Specialist Periodical Report, Royal Society of Chemistry, 1986, xiv + 474 pages, £95 (non-members), £50 (members), ISBN 0-85186-173-3.

In a review of a previous volume of this series, the reviewer commented rather unfavourably on the price of the book. It would seem that the editors took this criticism very much to heart, since in the foreword they "deeply regret that purchasers will have to pay so much for it". This is an extremely useful book and the price to members of the Royal Society of Chemistry is very reasonable in the context of modern book prices. Since the least expensive grade of membership costs only £31, I would warmly recommend prospective individual purchasers to join the Society and enjoy not only their savings on books but also many other benefits.

The organisation of this book involves the material being divided mainly according to the spectroscopic technique used, and the styles of the chapters vary widely. The first, and much the longest, deals with nuclear magnetic resonance spectroscopy. This has clearly been a formidable task, with over 3000 literature references. The result is an extremely valuable survey, but definitely not a fireside book for the casual browser. The writers of the next two chapters on respectively nuclear quadrupole resonance spectroscopy and rotational spectroscopy have produced more easily read accounts, but they have less material to consider.

Chapter 4 reviews characteristic vibrations of compounds of main-group elements, and is followed by an account of vibrational spectra of transition element compounds. Chapter 6 considers the vibrational spectra of some coordinated ligands. All these three chapters are organised according to periodic table groups, and provide not only valuable reference data but also many insights into the chemistry of the molecules under discussion. Chapter 7, dealing with Mössbauer spectroscopy, is also divided according to element, with the longest sections, predictably, on iron and tin. The final brief chapter details structures determined by electron diffraction techniques.

Most of the chapters of this book cover the literature from late 1984 until late 1985, and cover it very thoroughly. There is no index, but the chapter contents are very detailed and provide most, if not all of the guidance needed. The book has been produced in a camera-ready format, which means that some sections are more attractive than others in appearance (the prize for layout would definitely go to Chapter 3 by S. Cradock), but this has probably contributed to keeping costs low. This is an excellent addition to this series and deserves a place both in libraries and personal collections.

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