

Book review

Problems and Solutions in Organometallic Chemistry, by S.E. Kegley and A.R. Pinhas, Oxford University Press, 1987, xii + 323 pages, £15.00, ISBN 0-19-855720-5.

In the last two or three years there have been several new textbooks on organometallic chemistry, but most have not contained problems to reinforce the principles discussed. Thus, this book will be extremely welcome to students seeking to test their skills, and probably equally so to faculty in need of problem sets and examination questions. The book is intended to match the subject material covered in the second edition of Collman, Hegedus, Norton, and Finke's "Principles and Applications of Organotransition Metal Chemistry". This point should be born in mind by the prospective purchaser; in common with many transition metal chemists, the authors clearly believe that this is the only organometallic chemistry which students need to be taught and main group organometallics are not considered at all.

The first chapter of the book is essentially a compilation of IR and NMR spectroscopic data for typical organometallics together with a description of the main techniques available for structural characterisation. This provides an invaluable reference for all organometallic chemists and my only criticism would be that the limitations of certain techniques are not stressed. For example, the use of NMR coalescence and line broadening data to determine thermodynamic parameters is applicable in only a limited number of cases (and not strictly to that described in Chapter 4, question 5) and frequently gives inaccurate results. A brief discussion of computer simulation of such data would have been useful.

Subsequent chapters contain groups of problems and solutions grouped by topic including structure and bonding, substitution reactions, rearrangements, oxidative addition and reductive elimination, insertions, reactions with nucleophiles and electrophiles, metallacycles, alkyl and hydride complexes. The intention of the authors was to focus principally on mechanism, and they treat catalysis and applications to organic synthesis rather briefly at the end of the book. Whilst the mechanisms of many such reactions are not known, quite a number are well documented, and the recent literature contains ample examples to have made these sections more lively. The difficulty of the problems is quite variable; under structure and bonding for example, the beginner will find drill exercises in electron counting and the more advanced student will discover challenging problems using the isolobal approach. The solutions are extremely fully and clearly explained, with appropriate literature references. Nonetheless, the basic information is assumed and this book is clearly meant as an adjunct to, not a replacement for, a text book or lecture course. The style is extremely "reader-friendly" (for example, "If all has gone well, get a beer") and I think this book will be very popular with students. It is written at the level of a final year undergraduate or beginning graduate course, but

more advanced students will also find stimulating problems.

Most of the problems presented are derived from the recent literature with papers cited up to mid 1986. The rate at which it has appeared was thus heroic and some aspects of presentation have suffered in consequence. This was a camera-ready manuscript and I did note a number of inconsistencies of terminology and typographic errors. A number of the diagrams are a little raggy at the edges and vary substantially in size, even on a single page. There is both an author and a useful compound index. Thus, although this book has limitations, it fills a real gap in the student library and at a modest price; I can recommend it strongly.

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Mechanisms of Ionic Polymerization: Current Problems; by B.L. Eusalimskii, Plenum, ix + 306 pages, US \$89.50, ISBN 0-306-10991-3.

This is the second in a series of volumes, entitled 'Macromolecular Compounds'. It addresses itself to the reader who is supposed to be well-informed with respect to the general literature in this field and is stated to consider "current problems". The initial chapter provides a general introduction from which such readers will learn little. Chapter 2 details research methods for the study of the nature of the ionic active sites and subsequent sections deal with "multicentredness", reactivity between active sites and monomers in homogenous systems, and stereospecificity.

Unfortunately the negative aspects of this volume tend rather to obscure such positive merits as it has. It is indeed useful in alerting the Western reader to material published within the Eastern Bloc which has not been translated. Also some interesting points are raised, particularly with regard to the physico-chemical and kinetic aspects of polymerisation. On the debit side, however, must be recorded first either a particularly odd style in the author or in the translator. Neologisms and oddities abound (try macroeffects, informativeness, post-effects) and I was left with an impression of unnecessary length and clumsiness, and an unhelpful lack of punctuation. A number of abbreviations which did not appear standard or consistent are used. There are no references after 1983, and most are from the 1970's, giving the work a somewhat dated air. Also full titles are quoted in every case, which is surely unnecessary, and there are no Chem. Abstr. references even to the most obscure material. The emphasis on work from the Eastern bloc is something of a mixed blessing. The index cited in the contents as appearing on page 307 does not exist.

Eastern European work in the field of polymer chemistry has been important and well-regarded in recent years. Unfortunately, this book does it little service. Its style makes it rather unreadable, and without an index it is doubly hard to use. There are too many review style volumes published at present; one with as many faults as this should have been weeded out.

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