orientation into the presented material is facilitated by its logical arrangement and by the fact that the authors assume only a basic knowledge of organic and organometallic chemistry. The wealth of information contained in this monograph is divided into 13 chapters, each containing approximately 130 references. Besides the extensive bibliography, additional reading is suggested at the end of all the chapters. This should prove especially helpful to chemists starting in this field. The coverage of literature is quite complete through the year of 1980.

The book begins with an introduction where the historical background, basic definitions, and mechanistic principles are briefly mentioned. The rest of the book is separated into two parts. The first part, entitled "Mechanistic Principles of Metal-Catalyzed Oxidations", consists of seven chapters concerned with metal-catalyzed radical oxidations by molecular oxygen, radical and heterolytic oxidations by alkyl hydroperoxides and hydrogen peroxide, activation of molecular oxygen, direct oxidation with metals or metal oxo species, activation of substrates by coordination to transition metals, and finally biochemical oxidations. Stoichiometric oxidations are mentioned only where needed for illustration of mechanistic discussions. Oxidation with peracids, ozone, or other species, which are neither initiated nor catalyzed by metals, are omitted. The main emphasis is on providing sound mechanistic principles on the molecular basis. The effects of surfaces in heterogeneous catalysis and the role of apoenzymes in biochemical oxidations are treated only superficially.

The second part, entitled "Synthetic Methodology of Metal-Catalyzed Oxidations", focuses on oxidations which are judged useful for either laboratory-scale synthesis or for industrial production. The material covered in the second part is arranged into five chapters, according to the substrates undergoing oxidation. It is the opinion of this reader that the second part lacks the exellence of the first one. The choice of material is a bit confusing since some of the highlighted systems give only marginal yields of the desired products. In a few cases both stoichiometric and catalytic oxidations are presented; yet, based on the information in the text, the reader cannot always make a clear distinction between these two options (e.g., oxidation of phenols, in the presence of copper complexes). The mechanistic aspects presented in this section inevitably repeat some information presented in the first part.

It is almost unavoidable in a work of this scope not to have errors in the text. Thus, on the last two lines of page 43, eq 63 and 64 should read 63A and 63B. The first equation on page 138 should be called eq 70. The second intermediate in eq 60 on page 171 should be a radical species. Mercaptors on page 395 should read mercaptans.

In summary, the authors definitely succeeded in their goal of presenting a unified mechanistic understanding of oxidation reactions and in providing a needed and excellent summary of the literature in this area. Any chemist engaged in either basic or applied aspects of oxidation reactions will find this book indispensable.

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The Organic Chemistry of Iron. Volume 2. Edited by E. A. Koerner von Gustorf, F.-W. Grevels, and I. Fischler. Academic Press, New York. 1981. ix + 340 pages. $39.00.

The report of the preparation of the first organoiron compound with an organic ligand other than carbon monoxide, (η^4-butadiene)iron tricarbonyl, by Reihlen et al. in 1930 did not attract much attention. In contrast, the preparation of ferrocene and the demonstration of its novel sandwich structure in 1951 opened the floodgates of organotransition-metal chemistry. The organic chemistry of iron in particular has received much attention since then, and now, 30 years later, there is a vast amount of information available on all aspects of this subject.

An excellent survey of organoiron compounds was begun in Volume 1 of "The Organic Chemistry of Iron" in 1978. The second and final volume has now been published. This book contains four chapters, all written by experts in the topics which they treat.

The first chapter, by R. C. Kerber, surveys iron complexes of trienes, tetraenes, and polyenes in 153 pages, with literature coverage through 1976. This is a well-organized and thorough discussion of the synthesis, structures, and chemical properties of the complexes of diverse iron-containing moieties with cyclic and acyclic polyolefinic ligands. There is considerable overlap with the material on iron compounds in Deganello's 1978 book "Transition Metal Complexes of Cyclic Polyolefins".

In the second chapter of 33 pages R. B. King reviews the arene complexes of iron which include cationic and neutral η^6-arene complexes, others with η^2, η^3, and η^4 benzenoid ligands, as well as borabenzene, phosphabenzene, and thiophene complexes. In view of the reactivity of the cationic η^6 complexes and their ease of preparation, it is surprising that they have not found more applications as intermediates in organic synthesis. They deserve more detailed attention.

A 94-page chapter by the late P. Chini on compounds with iron–metal (including iron–iron) bonds follows. This chapter covers a great variety of structures and chemistry, but its well-conceived organization results in an orderly, instructive, and very readable treatment of the subject.

The final short chapter of L. Markó and B. Markó-Monostory treats the more restricted topic of iron complexes with sulfur-containing ligands, with a literature cutoff date of "early 1979". The chapter abounds with novel structures and the often completely unexpected reactions which form them but offers little concerning the chemistry of the complexes treated. It is obvious that much remains to be done in this area.

There was some delay in the publication of this book, no doubt caused in part by the untimely death of one of the editors, E. A. Koerner von Gustorf, in 1975. Chini's chapter covers the "more relevant" literature only through 1975 and later references "have been restricted to a minimum". Kerber's chapter has an addendum dated December 1979 and King's chapter appears to end with the 1975 literature. Nevertheless, the book can be recommended to the reader as one which will be very useful to those interested in organoiron chemistry. With its companion volume, "The Organic Chemistry of Iron" is an excellent survey of this important, very active area of organotransition-metal chemistry.

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Organometallic Syntheses. Volume 2. Nontransition-Metal Compounds. By J. J. Eisch. Academic Press, New York. xiv + 194 pages. $29.50.

The goal of this book is to provide guidance in the specialized techniques necessary for the synthesis, handling, and characterization of main-group organometallic compounds. This new volume is a welcome addition to the literature. The problems associated with synthetic main-group chemistry cannot be solved by simple extensions of the procedures for transition-metal organometallic compounds as described in Volume 1 of this series. Volume 2, like its predecessor, is separated into two parts. The first section describes general experimental techniques and considerations. The second part details the specific syntheses of over 85 main-group compounds but relates these procedures to other derivatives.

In part I the considerations and techniques for the execution, purification, and characterization of compounds are discussed. John Eisch, one of the foremost investigators in main-group chemistry, also suggests potential problems that must be considered for a successful procedure. Even though much of this first part on experimental techniques could be common knowledge to many synthetic chemists, the inclusion of this material serves as a clear warning to the unsuspecting chemist. Main-group organometallic compounds are exceedingly reactive, and the chemist must pay scrupulous attention to every experimental detail. Specific apparatus and methods are adequately described. However, it is regrettable that the section on the characterization of compounds does not provide general data for compounds of all elements considered in part II.

The second part describes the syntheses of specific compounds of Li, Mg, Zn, Hg, B, Al, Ga, In, Tl, Si, Ge, Sn, and Pb. Compounds of beryllium and cadmium are obvious omissions. The experimental procedures, classified according to the metal by periodic group, are for compounds which seem at first glance to be unusual. However, compounds which are commercially available and relatively inexpensive and those already described in "Inorganic Syntheses" and "Organic Syntheses" have been