

respect to molecular geometry and thermodynamic stability. The diversity of descriptive chemistry, however, does require some skeleton on which to hang the meat of the matter. This chapter will serve as an excellent aid in learning and remembering facts of chemistry. Considering that so much of the present literature is devoted to explaining stability and structure in simple terms, it seems quite appropriate that this volume include a chapter such as this one.

"Metalloenes" by William F. Little.—In contrast to the chapter by Professor Rundle, this chapter is devoted almost entirely to the preparation and chemical reactions of ferrocenes and other metalloenes. There is little doubt that the metalloenes form one of the most interesting chapters in modern inorganic chemistry and have served to stimulate much novel inorganic synthesis and thought concerning chemical bonding. This chapter, together with that of Rundle, presents the reader with a considerable (and contrasting) discussion of transition metal chemistry.

"Oxidation Reduction Mechanisms in Organic Chemistry" by Kenneth B. Wiberg.—There is a large body of systematically gathered data on the oxidation-reduction chemistry of organic compounds. Professor Wiberg presents a well-organized classical mechanistic discussion of a goodly section of this area. The article is well flavored with the difficulties of deciding likely mechanisms and also of the modes of resolution of these difficulties. The presentation is by highly specific example and is crisp. The article serves the avowed purpose of this book splendidly.

"The Chemistry of Biological Energy Transfer" by William B. Jencks.—This chapter is certainly the grandest of the collection in area of material. The amount of material covered is vast, and yet much detail is included. This is not a chapter which can be skimmed profitably. The reading is difficult and certainly requires a reasonable working knowledge of the details of chemistry. In view of what the author attempts (and succeeds in), it could not be otherwise. The content of the chapter is just what the title says. One cannot be other than deeply impressed by the depth of chemical understanding of metabolic processes available today. In summary, this chapter is to this reviewer, the most valuable of the collection.

"The Structure of the Grignard Reagent and the Mechanisms of Its Reactions" by Rudolf M. Salinger.—The historical and practical importance of the Grignard reagent is well known. It would seem likely that by now the structure of the Grignard reagent would also be well known. The present chapter shows the latter not to be the case. The difficulties of the determination of molecular geometries in solution are seen clearly in this chapter. The first part of this work shows that even the molecular units present in solution are quite uncertain and quite likely to vary with solvent, halide, and aryl or alkyl groups. The second part of this chapter discusses the mechanisms of reactions in terms of detailed transition-state structures. In view of the difficulties in ascertaining the structure of the Grignard reagent itself, these transition state structures seem of dubious permanent value. It would seem to this reviewer that systematic studies of polymerization of magnesium halides, and of magnesium dialkyls and diaryls would be the first step in understanding the reaction composition. The question of whether the species $RMgX$ exists and is "the" Grignard reagent is obviously the basic question.

In summary, there is a considerable range in the quality of the articles presented. Some will have a relatively long life of usefulness. Considering the purpose of this series it seems fair to consider it a modest success.

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Catalysis and Inhibition of Chemical Reactions. By P. G. ASHMORE, Lecturer in Physical Chemistry, University of Cambridge, Fellow and Tutor of Churchill College. Butterworth, Inc., 7235 Wisconsin Ave., Washington, D. C. 20514. 1963. 375 pp. 16 × 25.5 cm. Price, \$14.95.

In the preface to this book the author states that he has "... chosen as wide a definition of 'catalysts' as allowed in order to compare and contrast mechanisms. . . ." Such a goal requires coverage of a wide variety of reactions, and in this respect, the book lives up to its promise. The discussion ranges

from thermal decomposition to polymerization—from proton and electron transfer in solution to atom transfer in gas reactions—from heterogeneous catalysis to enzyme catalysis. These topics are developed in some depth as attested by the 900 references at the chapter ends. Thus, here we have a book that should be of particular interest to researchers in one of these areas who seek to broaden their outlook as well as (to quote the author) "students of all branches of chemistry."

Books written for specialists can be effective even when terms and concepts are unclearly presented so that familiarity with the literature is required for understanding, but a summary for non-specialists must be clear. In this respect the book falters. Clarity is sometimes lost because of muddy presentation. For example, in his discussion of adsorption on heterogeneous catalysts the author observes: "The specific effects of crystal face may also be due to the possibility or otherwise of multiple bonding of an atom to several surface atoms." (Italics are mine.) In the same chapter he also observes: "Some recent evidence (see p. 139) suggests that the pattern of sites may be *between* the surface atoms at low coverage, but changing to the surface atoms at higher coverage³." On page 139, there is no elaboration on this statement, nor is the evidence revealed. Furthermore, the reference cited is a 35-page review article on chemisorption of metals with 125 references.

In some sections the author sacrifices precision for brevity. This is most distressing in his discussion of the kinetics of polymerization kinetics where he uses m_j^* to indicate a radical chain with j segments; then, without redefinition, he (apparently) uses the symbol $[m_j^*]$ to represent the total concentration of all radical chains. Such lack of precision also appears in the running text. For example, in this same chapter he states that activation energies obtained by different workers for the same reaction are "not very different"; in the accompanying table we find that different workers report 0 and 5.2 kcal./mole for the same reactions.

Finally, the density of typographical errors seems higher than usual. True, some of these are trivial, but some are troublesome.

In evaluating any book, the good points must be weighed against the bad points. On the plus side, we find a variety of reactions presented in considerable depth; on the minus side, we find the defects mentioned in the preceding paragraphs. In the balance, the book is a valuable reference in spite of its defects. But without these defects, it would have been outstanding.

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Indolalkaloide in Tabellen. By MANFRED HESSE, Assistent am Institut für Organische Chemie der Universität Zürich. Springer-Verlag, Heidelberger Platz 3, Berlin-Wilmersdorf (West), Germany. 1964. 212 pp. 21 × 29.5 cm. Price, DM 24.

Indole alkaloids have been in recent years the subject of extensive investigations in different laboratories throughout the world. This has been the result of the discovery of remarkable physiological properties of various representatives of this class of natural products such as reserpine, lysergic acid diethylamid, and, more recently, vincalukoblastine (VLB), a useful therapeutic agent in the treatment of human neoplasms. According to Manfred Hesse, the author of the newest catalog of indole alkaloids, an average of eight new indole alkaloids appeared monthly in the literature in 1963. In this era of structure elucidation by mass spectrometry and X-ray method, it is hard for a standard textbook on alkaloids to keep up with the new findings. This is one of the reasons why Hesse's Tables will certainly be a most useful catalog for all those who are working in this field.

Hesse's Tables contain data on 511 alkaloids. At the time of printing, the structures of 304 of these were known. Alkaloids are listed in groups according to certain types, such as Olivacine (I), Canthine (II), Iboga (III), Aspidosperma (IV), etc. A great virtue of the Tables lies in the presentation and placing of the various data to the right of the structure. Each position (occurrence; structure determination; melting point; optical rotation; infrared, n.m.r., mass, and ultraviolet spectra; and synthesis) is accompanied by a reference number, with references to be found on the bottom of the same page. Only those who assemble this type of data can appreciate the enormous amount