Structure of Metallic Catalysts; by J.R. Anderson, Academic Press London, New York, ix + 469 pages, 1975, £12.80, $33.25.

It is pretty rare these days to be treated to a worthwhile and readable monograph written by a single author; how much better this volume is compared to the more usual disjointed collection of papers presented at some conference.

The material, although admittedly descriptive and qualitative, is valuable reading for surface, catalytic and, indeed, organometallic chemists. A brief introduction to metals, their surfaces and chemisorption can only be faulted by its inevitable omission of the newest results on the energy levels of surface molecules, being provided now by photoelectron spectroscopy. The chapter on support materials is extremely informative and there is an admirably balanced discussion of "massive metal catalysts". An examination of dispersed metal catalysts is followed by a discussion which must interest most inorganic chemists: the structure and properties of small metal particles. Perhaps the choice of metal clusters, to illustrate a number of points, is somewhat eccentric and it is a pity not to read more about the organometallic chemistry of clusters; even so, there are useful thoughts and ideas to be picked up here.

Measurement techniques related to surface area, particle size and pore structure and, later, to surface composition and structure are finally described; the latter discussion is somewhat déjà vu since it was presumably written in 1973 or 1974 as the new spectroscopic techniques were beginning to come into their own. But this is really a minor drawback in a book which deserves to sell well.

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Physical Organic Chemistry. The Fundamental Concepts; by C.D. Ritchie, Dekker, New York, vii + 283 pages, Swiss Fr. 58.

This very good book really does, as the title implies, concentrate on the fundamental aspects of physical organic chemistry. That is, the emphasis is heavily on principles, with accounts of specific reactions limited to those which directly illustrate these principles. The chapter headings clearly indicate the scope: (1) Kinetics: integration of simple rate expressions; (2) Kinetics: characterization of transition states; (3) Combination of kinetics, stereochemical, and product studies; (4) Structure and reactivity: empirical relationships; (5) Structure and reactivity: molecular orbital theory; (6) Carbonium ion, carbanion, and base-equilibria; (7) Acid-base catalysis; (8) Equilibrium and secondary isotope effects; (9) Transition state theory and primary isotope effects; (10) Carbanian chemistry.

This is a scholarly work, with a difference in approach and coverage which makes it a most valuable addition to textbooks on physical organic chemistry. It demands careful attention from the reader, but the effort is well rewarded.

To my mind all but the best undergraduates would find this book too difficult as an introduction, but, on the other hand, only the poorest would fail to derive much benefit from studying it after acquiring a working knowledge of physical organic chemistry from lectures and more conventional textbooks on the subject.

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"Houben—Weyl — Methoden der Organischen Chemie", 4th Edition, Vol. 13, Part 7, "Metallorganische Verbindungen: Pb, Ti, Zr, Hf, Nb, Ta, Cr, Mo, W"; E. Müller, editor-in-chief, G. Thieme Verlag, Stuttgart, 1975, xxxii + 570 pages, DM 330.

This book continues the Houden—Weyl coverage of organometallic compounds. Included are six chapters devoted to organic derivatives of lead, of titanium, zirconium and hafnium, of vanadium, niobium and tantalum, of chromium, of molybdenum and of tungsten. The lead chapter, written by E. Langer and based on an earlier draft by the late G. Bähr, is the longest one by far (260 pages). The other five chapters were written by A. Segnitz and range from 36 pages in length (organotungsten compounds) to 74 pages (Group IVA organic derivatives). The length of the lead chapter is not surprising: the first organolead compound was reported in 1853, organic derivatives of the transition metals, with a few exceptions, almost 100 years later. Furthermore, the large-scale commercial application of tetraethyllead as an antiknock agent provided the impetus for a great deal of research in the organolead area in the period 1925—1965.

The transition metal chapters would have been much longer if all types of organic derivatives of these metals had been included. However, the coverage is restricted to compounds containing at least one carbon—metal σ bond. σ-Alkyl, alkenyl, alkynyl, aryl and acyl derivatives are discussed. Compounds containing only π-bonded organic ligands are excluded and will be covered in a later Houben—Weyl volume.

As in all books of the Houben—Weyl series, the emphasis here is on preparative aspects and on reaction chemistry. Well-referenced sections show the reader how to prepare all classes of σ-bonded derivatives of the metal in question and provide detailed directions for many individual compounds. However, lists of individual compounds and their properties are not given; that type of coverage is left to the Gmelin series whose already issued volumes on organo-vanadium, -chromium, -zirconium and -hafnium compounds nicely complement the respective chapters in the present book.

Reactions involving the metal—carbon bonds of the classes of compounds covered in this book are discussed in detail: thermolysis, photolysis, protolysis, reduction, oxidation, halogenolysis, insertion reactions, reactions with metals, etc. The lead chapter has a concluding section dealing with analytical aspects; the transition metal chapters do not. Sorely missed is