

shape of the curves relating percentage oxidation of a reaction system to its oxidation-reduction potential. Graphical methods for obtaining the various ionization or equilibrium constants which in special cases may be superimposed on the measured oxidation-reduction equilibria are enumerated. Statistical treatment of data, now made practical by the wide availability of electronic computers, is not included. A chapter is devoted to the detailed consideration of the problem of electrochemical and especially pH standards. Experimental techniques, mainly of the classical variety, are considered in some detail in a valuable separate chapter. Polarography, considered outside the scope of the present work, is only briefly discussed in a single chapter with other miscellaneous topics. The final part of the work consists of about one hundred and sixty pages devoted to compilations of oxidation-reduction potential data for various different organic systems. There is included an extensive bibliography and an index which seems quite complete. The book is attractively made and quite free from mechanical errors.

The outstanding characteristics of the work are the author's historical perspective, his authoritative but easy style, his careful critical sense and his close integration of the theoretical and experimental aspects of his subject. Neglected are some of the more modern developments such as the work of Delahay and others on kinetic complications in electrode processes and Gerischer's work on exchange currents.

Electrochemical specialists will value this volume chiefly for its historical perspective and pedagogical worth. For any non-specialist or student interested in making and/or interpreting electrode potential measurements of organic systems it will be indispensable.

DEPARTMENT OF CHEMISTRY  
INDIANA UNIVERSITY  
BLOOMINGTON, INDIANA

V. J. SHINER, JR.

**Modern Coördination Chemistry. Principles and Methods.**

Edited by J. LEWIS, Department of Chemistry, University College, London, and R. G. WILKINS, Department of Chemistry, University of Sheffield. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, New York. 1960. xvi + 487 pp. 16 X 23.5 cm. Price, \$12.50.

Interest in the chemistry of coördination compounds has grown tremendously within the last few years, and, seemingly, is still increasing at a logarithmic rate. In the United States and Britain, at least, this was probably triggered by the demands of war-time research, but other factors have also been important. Among these, one might mention the general increase in interest in inorganic chemis-

try, the development of physical research methods, and the commercial availability of precision instruments for physical measurements. One must mention also the stimulating effect of bold theorizing by Pauling, the Bjerrum's and others, and the beautiful experimental work of Morgan, Sidgwick, Mann, Burrows, and numerous other pioneers in the upsurge of interest in this field. Improvements in experimental methods have led to modifications of the classical coördination theory, and it is now recognized that the metal-ligand bond is, in reality, several kinds of bonds. The realization of this multiplicity has greatly stimulated further research in the chemistry of complexes and has opened vistas which were not even imagined a decade ago.

As was to be expected, the rapid growth in the number of research publications on coördination compounds has stimulated the appearance of several books dealing with various aspects of the chemistry of these compounds. Interestingly enough, each of these has been quite different from the others, and each has filled a real need. The most recent of them, "Modern Coördination Chemistry," is no exception. It might equally well have been titled "Physical Coördination Chemistry," for in it the authors have discussed the physical principles underlying the behavior of coördination compounds and the major physical techniques which are used in investigating them. Experimental methods are described in good detail, and then the interpretation of the results. Each of the six chapters is written by an author (or authors) who can speak with authority based upon his own research experience in the field in question. All of the authors write lucidly and critically, with interesting comments on the research which they are reporting, and with extensive documentation. The book contains more than 1400 references, roughly ninety per cent. of which are taken from the literature of the last decade. The authors have succeeded admirably in their dual goal of writing so that any experienced chemist can read with understanding, and so that experts in the field will find the book valuable as a reference and review. All will find it richly rewarding.

Nothing more need be said other than to list the authors and the chapter titles, which will show the scope of the book: The Thermodynamics of Metal Ion Complex Formation in Solution (F. J. C. Rossotti); The Reaction Rates of Transitional Metal Complexes (D. R. Stranks); The Isomerism of Complex Compounds (R. G. Wilkins and M. J. G. Williams); The Visible and Ultra-Violet Spectra of Complex Compounds (T. M. Dunn); The Infrared Spectra of Transitional Metal Complexes (F. A. Cotton); The Magneto-Chemistry of Complex Compounds (B. N. Figgis and J. Lewis).

DEPARTMENT OF CHEMISTRY  
UNIVERSITY OF ILLINOIS  
URBANA, ILLINOIS

JOHN C. BAILAR, JR.