

and publishers have taken in the preparation of an up to date and comprehensive treatise on the subject.

The authors state in the preface that the volume is the outgrowth of a series of notes prepared for a graduate level course covering the theory, application and design of large time-bandwidth radar signals, given to co-workers at the Sperry Gyroscope Company, and they express the hope that it might be used as an introductory textbook for other students following such a course. Certainly each chapter is more or less complete in itself, as would correspond to a lecture course, but it is doubtful whether it would be suitable as a textbook for use in Great Britain. It is undoubtedly, however, an important contribution to the literature on radar engineering and an extremely valuable exposition of, and reference to, the present knowledge of complex radar waveforms.

S. WEINTROUB

ALL ABOUT ELECTRODEPOSITION

Fundamentals of Metal Deposition

By E. Raub and K. Müller. Translated from the German. Pp. viii+268. (Amsterdam, London and New York: Elsevier Publishing Company, 1967.) 125s.

THIS book is a welcome addition to the literature of electrodeposition in the English language. It should be of great value to students in this field and to many of those already in industry who wish to understand the important fundamental processes on which their technology depends.

The first two chapters deal with the physical chemistry of electrolyte solutions and fundamentals of electrode processes. These will provide useful revision for those with a good background of physical chemistry and sufficient coverage of the subject for those who have not. The third and fourth chapters are concerned with cathodic discharge processes and various aspects of the structure of electrodeposits. In the first of these the treatment of electrocrystallization does not seem to be fully up to date and the section on hydrogen deposition is disappointing. There are few references here to recent researches concerned with ad-ions, mechanisms of incorporation of deposited ions into the crystal lattice, surface diffusion and other growth processes. Details of information concerning the mechanistic steps in hydrogen deposition are also inadequate, as is the literature cited. The final chapters are concerned with the physical and chemical properties and the distribution of deposited metals on the cathode. These chapters are up to date and the section on microthrowing power and levelling is excellently presented and illustrated.

The literature cited is biased towards German publications and the research interests of the authors. This is not unreasonable in view of the authors' long experience and expertise in the field. The text is easy to read, excellently illustrated throughout, and the standard of translation is high. Despite the few criticisms made, this book should be found on the bookshelves of all interested in electrodeposition.

I. A. MENZIES

INTRODUCING CATALYSTS

Introduction to the Principles of Heterogeneous Catalysis

By J. M. Thomas and W. J. Thomas. Pp. x+544. (London: Academic Press, Inc. (London), Ltd.; New York: Academic Press, Inc., 1967.) 120s.; \$21.50.

IN the scope of a textbook of medium length, the authors have presented a comprehensive introduction to a subject which has many aspects. It differs from some previous texts, among them those to which the authors have referred in their preface, by the inclusion of a brief chapter on the selectivity of catalysts and a discussion of

stepwise heterogeneous reactions, and a substantial one which introduces the design of catalytic reactors. This unusual breadth of the discussion of the principles of catalysis has resulted from the collaboration of a chemist with a chemical engineer.

Other chapters present the theory of adsorption; experimental methods in the study of adsorption; porosity and surface area; the role of lattice imperfections; geometric and electronic factors; and the mechanism of typical heterogeneous reactions. The review of experimental aspects of adsorption includes accounts of several of the techniques which have been developed more recently, such as flash desorption, infrared absorption, slow electron diffraction and the application of nuclear magnetic resonance and electron spin resonance methods to heterogeneous systems.

In this book consideration has been given to metals, oxides and non-metals, whereas many previous studies have been biased to a particular catalyst type. Consideration of the diversity of catalysts has led the authors to lay particular stress on the environment of the atomic site of catalytic activity. This aspect of the theory of catalysis is increasingly attracting attention (for example, in the Faraday Society discussion in 1966) because of the contribution which ligand field theory has made to understanding of the transition complex in the surface of a solid.

The book is excellently presented, with copious references, especially in the experimental section, a good author index, and a subject index which, if used in conjunction with the list of contents, is comprehensive. It can be recommended to research workers who want an up to date manual of this topic, and will be found to be stimulating by many who are already well informed about heterogeneous catalysis.

A. COUPER

PHOTOCHEMISTRY TRIBUTE

Photochemistry and Reaction Kinetics

Edited by P. G. Ashmore, F. S. Dainton and T. M. Sugden. Pp. xvi+378. (London: Cambridge University Press, 1967.) 75s. net; \$13.50.

A NUMBER of authors have contributed to this volume, the common link being that most of them were former research students of Professor R. G. W. Norrish and three have made distinguished contributions in their own countries to fields of study closely related to the interests of Norrish. The book is therefore a spontaneous token of affection to a scholar and personality of world wide reputation.

The series of review type articles covers the principal interests of Norrish and is divided into two parts, one dealing with photochemistry, the other with combustion kinetics. Separating these parts is a review of polymer chemistry.

There are general contributions by W. A. Noyes and Bernard Lewis, who review the contributions to science which have been made by Norrish. These are followed by a discussion of photochemistry in the liquid phase in which the importance of "cage effects" is stressed, both in inorganic and organic systems. In the gas phase, photochlorination is fully dealt with and the now well established technique of flash photolysis is the subject of two contributions. This part concludes with a detailed chapter on energy transfer in molecular collisions. Norrish's contributions to polymer chemistry are examined in the light of current knowledge in a review which deals almost entirely with free radical processes.

The final part of the book, dealing with combustion, is introduced by Semenov and in four reviews gives a clear account of the broad outlines of a difficult field of research. The individual topics dealt with include the mechanism of hydrocarbon oxidation in the gas phase, the pheno-