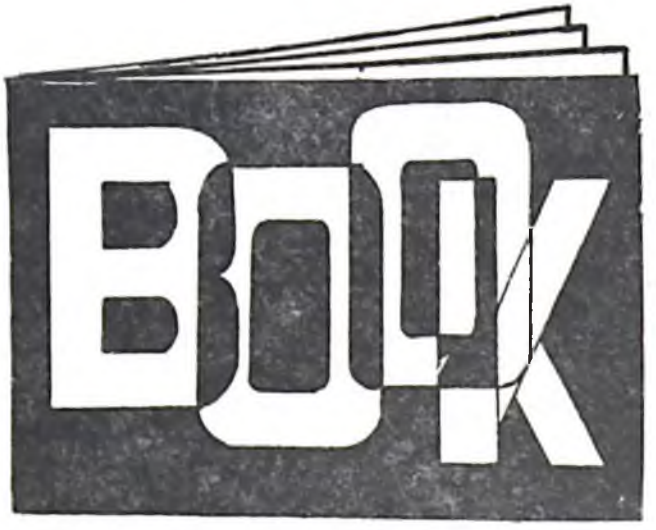


SECTION

BOOK REVIEWS

Ion Exchange and Solvent Extraction, Vol. 1977, edited by Jacob A. Marinsky and Yizhak Marcus, published by Marcel Dekker Inc., 270. Madison Avenue ,New York, N.Y. 10016, 312 pages, bound, Illustrated $ 32.50.

This is the 7th volume of the Ion Exchange and Solvent Extraction, incorporating authoritative and critical reviews of the extensive literature in these two closely related methods of chemical separation.

The first two chapters of volume 7 form a continuation of a subject begun in Volume 2 of this series, and expanding the previous discussions in accordance with recent developments. In chapter I, Schmuckler and Goldstein discusses the interphase mass transfer rates of chemical reactions with crosslinked polystyrene. Chapter 2 with 164 references, by Davankov, Rogozhin and Isyurupa deals with the influence of polymeric matrix structure on performance of ion-exchange resins. Contents of chapter 3 by Heitner-Wirguin include spectroscopic studies of ion exchangers, supported by 158 references. Michale Reddy discusses the ion-exchange meterials in natural water systems in Chapter 4 while Bolto and Weiss presents the thermal regeneration of ion-exchange resins in the last chapter. Altogether, it is a good feast on ion exchange resins. The practical aspects are stressed wherever necessary.

With such a vast spectrum of information given on ion exchange resins in a neatly bound volume, the price seems to be reasonable, and there is no doubt, that this book will be of paramount importance to researchers and technicians in biophysics, biochemistry, hydrometallurgy, membrance research, radiochemistry, electrochemistry, and analytical, processing, physical and coordination chemistry.

Prof. K. I. Vasu,
Indian Inst. Science

2. **Fuel Cells for Public Utility and Industrial Power, Energy Technology, Review No. 18, 1977,** edited by Robert Noyes, Published by Noyes Data Corporation, Mill Road at Grand Ave., Park Ridge, N. J. 07656, 322 pages, Cloth bound, $ 42.00.

It is known that the fuel cells are potentially more efficient than a conventional steam-based plant, and one of the most interesting possibilities for future power generation would be power plants based on fuel cells. Since the fuel cells work electrochemically rather than by combustion, there is less of air, thermal or noise pollution. It is therefore timely that there is a great amount of activity in this field and NDC has brought out this volume containing all the information derived from US Government contracted studies. The book contains considerable practical, down-to-earth technical information relating to fuel cells for power plants.

After an introductory chapter, the discussion goes on to types of fuel cells, and their operation and use. The third chapter deals with assessment of fuels for power generation by electric utility fuel cells. The next two chapters are on the Westinghouse study and General Electric study respectively on Fuel Cells for public utility applications. The evaluation of fuel cell power plant is given in chapter 6 while the marketing considerations are given in the last chapter. Quite a large number of figures and tables are given in support of the discussion. A list of the proprietory processes with abstracts are given at the end, which itself runs to about 100 pages.

Here is thus book with a peep into the future of power generation systems, and it will go a long way

in giving a sense of direction to all those engaged in or concerned with such problems.

Dr. Y.V.R.K. Prasad,
Indian Inst. Science.

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3. **Transcient Techniques in Electrochemistry**, by Digby D. Macdonald, 1977, published by Plenum Publishing Corporation, 227 West, 17th Street, New York 10011, 329 pages, $ 37.50.

Widespread interest in the study of electrochemical reactions by relaxation or transient techniques has been with a view to obtain quantitative data on the rates of the 'Fast' electrochemical processes. The techniques developed evaluate the efforts of mass transfer and charge transfer at very short times. Development of several of the experimental techniques like potential step chronoamperometry, and chronocoulometry, chronopotentiometry, linear potential sweep and cyclic voltametry and a.c. impedence measurements has made it possible to study the phenomena in depth.

In the present book all the techniques adopted in the study of transcient electrochemical processes have been dealt with in great detail, with appropriate references to published work. A sound mathematical treatment precedes the discription of the experimental techniques.

The book is divided into eight chapters. The introductory chapter deals briefly with the fundamentals related to the study of charge transfer processes. Experimental methods and equipment adopted in the several of the studies including cell and electrode design, electronic instrumentation, potentiostats, and galvanostats are covered in chapter two. Mathematics of diffusion covering laplace transformation of Fick's Second Law, numeral analysis, digital simulataion and analog methods is dealt with in chapter three. This chapter is helpful in the evaluation of the data obtained in experimentation discussed in later chapters. In chapters 4,5,6 potential step chronoamperometry, chronocoulometry, chronopotentiometry, potential sweep and cyclic voltametry techniques are discussed in succession.

In each chapter, simple charge transfer reactions, coupled chemical/electrochemical processes and the mechanisms involved in them are described in detail, with the necessary mathematical interpretation. In chapter six, studies in adsorption has received some attention.

The AC impedance techniques adopted in the study of simple charge reactions, coupled chemical/electrochemical processes and faradaic rectification studies are covered in chapter seven. In the last chapter adaptation of the various techniques discussed earlier, in the study of surface processes like electrocrystallisation, filmgrowth, deposition and dissolution, and passivation has been discussed in detail.

References at the end relate to literature covered in each of the chapters individually. The author's experience in treatment of some of the textual matter at the graduate level has contributed largely to a clear exposition of the subject.

The book is suited for students at the senior level as also for those interested in the study of these techniques. It is a valuable addition to scientific libraries of research institutions investigating such phenomena in several fields of chemistry.

—J. Balachandra
Indian Inst. Science.

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4. **Structure Determination by X-Ray Crystallography** 1977, by M.F.C. Ladd and R. A. Palmer, published by Plenum Press, N. Y. and London. 393 pages, $ 29.50.

The book aims at presenting an introduction to structure determination by x-ray crystallography. Theoretical principles relating to crystal Geometry, scattering of x-rays by crystal and x-ray structure analysis including methods of solving the phase problem are followed by examples of crystal structure analysis. The authors have specifically chosen not to discuss experimental methods extensively ; rather the emphasis is on simulating the interpretive side of experimental crystallography. A number of examples and exercises are included to achieve this end Solutions and notes are given to the problems set at the end of each chapter.

The Hermann-Mauguin system of symmetry notation has been used but the Schoenflies symbols for point groups are also indicated at places.

The book is useful mainly to students and researchers in crystallography, chemistry and chemical physics. However, the book will also be of some interest in other disciplines such as Physics, Metallurgy, Biochemistry and Geology.

The book is indeed a valuable addition to scientific libraries of educational Institutions and research organisations.

-Dr D.H. Sastry,
IISc. Bangalore.