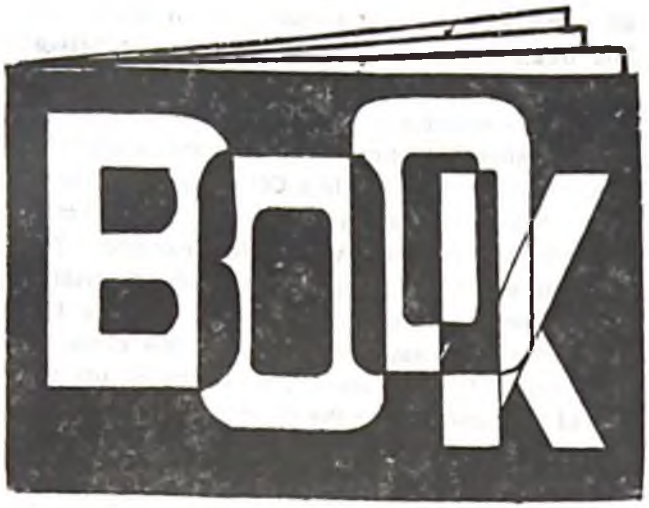


SECTION

BOOK REVIEWS

PRINCIPLES OF THERMO-DYNAMICS–*James A. Beattie and Irwin Oppenheim; Elsevier Scientific Publishing Company 1979, P. 329.*

This book is the second volume in the series publlcation 'Studies in modern thermodynamics'. Allthough there are large number of books on thermodynam'cs very few of them discuss in such great detail the postulates and laws of thermodynamics.

The authors define thermodynamics as a phenomenological discipline dealing with the interactions of the systems with surroundings and with the description of and the relation among the macroscopic properties of the system. The basic definitions and concepts required for the understanding of the subject have been discussed in chapter I. In next five chapters Zeroth law of thermodynam'cs, First law of thermodynam'cs their implications and applications have been discussed.

Partial molar properties and s:andard states have been treated in detail in chapter seven, Second law of thermodynamics and its applications have been discussed in next two chapters.

Chapter ten deals with concept of free energy and available work. Gibbs criteria for equilibrium and stability have been elaborately treated in chapter twelve. The last chapter deals with open systems.

The logical and rigourous approach followed in the book is very helpful in understanding the principles of thermodynamics. The present book will be useful both for the students and teachers.

Prof. A. K. LAHIRI
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INFLUENCE OF DIFFUSION COATINGS ON THE STRENGTH OF STEEL—*G. V. Karpenko. V. I. Pokhmurovskii, V. B. Dalisov and V. S. Zamikhovaskii Trans Tech. Publications, Trans Tech. House, CH-4711 Aedermannsdorf, Switzerland, 1979. 198 pages.*

This book is essentially a compilation of Russian literature on the subject. In the first two chapters of the book the residual stresses and their classification and influence of electrodeposited coatings on the mechanical properties of steel articles have been briefly discussed. Next eleven chapters deal with the methods used for various types of coatings and their influence on the mechanical properties of the steel. In the last two chapter of the book the methods of filling up the cracks in steel articles by diffusion and intensification of diffusion alloying of steel have been discussed.

Carburizing, Nitriding, Boronizing, Chromizing and Calorizing have been discussed in great detail. Useful data both for the methods of coating as well

as its influence on the properties are given in this book. Structure of the coating and substrate have been briefly disscussed.

This book will be usefull both for practicing metallurgists and research workers.

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SOLID ELECTROLYTES AND THEIR APPLICATIONS—*E. C. Subbarao. Plenum Press, New York and London 1980.*

This is one of the few books devoted to the electrochemistry of soled electrolytes. The book has been written by a team of research workers actively engaged in the study of solid electrolytes and their applications and offers a single volume source on the theoretical and experimental aspects of the subject.

A large part of the book deals with the applications of solid electrolytes including their use in the measurement of thermodynamic and kinetic data and construction of oxygen probes and pumps. There is also an extensive coverage of fuel cells and high energy batteries. A pleasing aspect is the inclusion of an extensive bibliography designed to facilitate future research in this area, though because of the delay in the publication of the book, the references cannot be considered as really up to date.

The final chapter on fabrication of solid electrolytes will be of considerable interest to research workers in India who have difficulty in getting the imported materials. The book will be of use to all those who are engaged in fundamental or applied work involving the use of high temperature solid electrolyte galvanic cells.

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PHOTOELECTROCHEMISTRY—*Yu. Ya. Gurevich, Yu. V. Pleskov and Z. A. Rotenberg Translation Editors : Halina, S. Worblowa and B. E. Conway Plenum Press (1980).*

The book presents the theory of photoemission in a novel fashion, to understand which, familiarity with quantum mechanics is not required. The treatment is primarly concered with photoelectron emission phenomena at metal solution interfaces. The treatment is fairly thorough and quantitative. heT use of photoemission process for the investigation of the structure of the electric double layer, electrochemical kinetics and homogeneous reactions involving free redicals like CO_2. H and OH, have been adequately dealt with. Photoelectron emission fiom semiconductors is briefly described. The last chapte entitled perspectives of photoemission studies focusses attention on several aspects like new techniques, new problems like the chemical behaviour of "dry electrons", problems of utilization of solar energy and the need to understand a variety of light-initiated processes. The book will be found useful to experimental electrochemists, physical chemists, radiation chemists, physicists and technologists.

Dr. H. SUBBA RAO
I. I. Sc.

STRESS CORROSION CRACKING OF STEELS—*Bu G. V. Karpenko and I. I. Vasilenko, Edited by A. Aladjam, Trans Tech Publica.ion. Trans Teach House, CH-4711 Aedermannsdorf, Switzerland, page 185 (including author and subject index) S.Fr. 68.00.*

This is a valuable book written by two well known scientists in the field of metallic corrosion. All aspects of stress corrosion cracking, of steels heve been discussed in detail. In addition to be wide international literature survey of the subject, the results of the authors investigations have been incorporated to either substantiate or contradict some of the mechanisms suggested in literature. Some of the experimental details given by the authors are valuble to those working in the field.

The book contains twelve chapters. The first nine chapters are devofed to the influence of various media such as acid, alkalies, nitrates, H_2S, the effect of composition, structural and mechanical properties of the steel, on the stress corrosion cracking of steels both structural steels and tool steels. The mechanisms in each case whether it be based on adsorption, electrochemical or electro-

chemical/mechanical have been discussed in detail supported by experimental data. The distinction between hydrogen embrittlement and electrochmical mechanism of failu e has been clearly broughtout.

The last three chapters are devoted to various methods of preventing stress corrosion craking, such as use of inhibitors, electroplating, decarburization of surface layers among others.

In the small volume of 184 pages the authors have covered the wide subject with brevity without sacrificing clarity.

It is very valuable book for any one interested in the stress corrosion cracking in general and that of steels in particular with ready references to latest literature on the subject.

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