BOOK SECTION

New Publications

Colorimetric Chemical Analytical Methods, published by The Tintometer Ltd., Salisbury, England, 6th ed, 2 volumes, 60 sh.

Proceedings, Conference on Anodizing Aluminium, University of Nottingham, September 1961, published by the Aluminium Development Association, London, 1962, 248 pages 40 sh.

The Science of Surface Coatings by H. W. Chatfield, published by D. Van Nostrand Co. Inc, Princeton, N.J., U S.A., 1962, 594 pages, $ 22.50.

Advances in Electrochemistry and Electrochemical Engineering — Vol. II. Electrochemical Engineering, by C. Tobias (Ed), published by Interscience Division, John Wiley and Sons, Inc., New York, 1962.

Symposium on Electroforming — Applications, Uses and Properties of Electroformed Metals, published by American Society for Testing and Materials, ASTM publication No. STP 318, 202 pages, $ 6.25.

The Electronics of Laboratory and Process Instruments, by V. S. Griffiths and W. H. Lee, published by Chatto and Windus, London, 1962, 368 pages, 50 sh.

Publications Received

Science and Appliance, Vol. 26, No. 8-10, 1962, The Ohio State University Research Foundation, Columbus, Ohio, U.S.A.

Industrial Finishing, Vol. 14, No. 172, 174, 1962; No. 175, 1963, Arrow Press Ltd, London.

Battelle Technical Review, Vol. 11, No. 10, 11, 1962, Battelle Memorial Institute, Columbus, Ohio, U.S.A.

Materials Protection, Vol. 1, No. 10-12, 1962, NACE, Houston, U.S.A.

CSIR News, Vol. 12, No. 22-24, 1962; Vol. 13, No. 1-3, 1963, New Delhi.

International Atomic Energy Agency Bulletin, Special Number, Dec. 2, 1962; Vol. 5, No. 1, 1963, IAEA, Vienna.

Insdoc List, Current Scientific Literature, Vol. 9, No. 23-24, 1962; Vol. 10, No. 1-4, 1963, New Delhi.

Quarterly Bulletin of Steel Statistics for Europe, Vol. 13, No. 1, 2, '62, United Nations, Geneva.

Zinc Abstracts, Vol. 20, No. 10-12, 1962, ZDA London, through India Lead Information Centre, Culcutta.

ISI Bulletin, Vol. 14, No. 6, 1962; Vol. 15, No. 1, 1963, New Delhi.

Australian Chemical Engineering, Vol. 3, No. 10-12, 1962, North Sydney, N.S.W.

Corrosion Technology, Vol. 9, No. 11, 12, 1962, Technology Publications Ltd, London.

Corrosion Prevention and Control, Vol. 9, No. 11, 12, 1962; Vol. 10, No. 1, 1963, Scientific Surveys Ltd, London.

Electroplating and Metal Finishing, Vol. 15, No. 11, 12, 1962; Vol. 16, No. 1, 1963, Robert Draper Ltd, Teddington, Middx, England.

Copper and Copper Alloys — Selected Microstructures and Equilibrium Diagrams, published by Copper Development Association, London, CDA Publication No. 64, 1962, 68 pages.

Buletinul Institutului Politechnic Din Iasi, Serie Noua, 1959, 1960, 1961.

Journal of the Electrochemical Society of Japan, Vol. 30, No. 1, 1962, ECS of Japan, Tokyo.

Corrosion, Vol. 18, No. 10-12, 1962, NACE, Houston, USA.

Review of Metal Literature, Vol. 19, No. 10, 11, 1962, American Society for Metals, Metals Park, Ohio.

Australasian Corrosion Engineering, Vol. 6, No. 11, 12, 1962, North Sydney, N.S.W.

Engineering Progress at the University of Florida Vol. 16, No. 7-10, Florida Engineering and Industrial Experiment Station, Gainseville, U. S. A.

Metal Finishing Journal, Vol. 8, No. 95, 96, 1962; Vol. 9, No. 97, 1963, Fuel and Metallurgical Journals Ltd, London.

Science and Engineering, Vol. 15, No. 9-12, 1962, India Society of Engineers, Calcutta.

Australian Journal of Applied Science, Vol. 13, No. 4, 1962, CSIRO, East Melbourne.

Florida Engineering News, Vol. 4, No. 4, 1962, Engineering and Industrial Experiment Station Gainesville.

Electro-Technology, Vol. 6, No. 4, 5, 1962, Society of Electronic Engineers, Bangalore.

Physical Chemistry, by G. H. Duffey, published by McGraw-Hill Book Co, Inc., New York-Toronto-London, 1962, 527 pages, 68 sh.

Journal of the Indian Institute of Science, Vol. 45, No. 1, 1963, Bangalore.

Metal Finishing, Vol. 60, No. 11, 12, 1962, Metals and Plastics Publications Inc, Westwood, N. J., U. S. A.

Cobalt, No. 17, 1962, Centre D'Information Du Cobalt, Brussels.

British Patents, Group 36, London.

Copper and Copper Alloy Plating, by R. Pinner, published by Copper Development Association London, CDA Publication No. 62, 1962, 213 pages.

The Nickel Bulletin, Vol. 35, No. 10, 11, 1962, The International Nickel Co. (Mond) Ltd., London.

Wiggin Nickel Alloys No. 67, 68, 1963, Henry Wiggin and Co Ltd., Hereford, England.

Inco-Mond Nickel, No. 3, 1962, The International Nickel Co. (Mond) Ltd, London.

UNESCO Bulletin, No. 12, 1962, South Asia Science Corporation Office, New Delhi.

A Guide to corrosion Resistance, by J. P. Polar, published by Climax Molybdenum Co, New York, 1961, 270 pages.

BOOK REVIEWS

The Electrochemistry of Semiconductors, *by* P. J. HOLMES (Ed), published by Academic Press, London and New York, 1962, 396 pages, 84 sh.

Electrochemical techniques have been of great importance in semiconductor research and development, and this book is a timely addition to the literature on semiconductors. It consists of eight chapters on the various aspects of the surface phenomena in the electrochemistry of semiconductors written by experts in the field. The first chapter by H. F. Gohr is about electochemical terminology in relation to semiconductor parameters Semiconductor-gas and — metal systems have been discussed by A. R. Plummer and the semiconductor aspects of a semiconductor electrode by C. G. B. Garrett. Experimental results on the electrochemical reactions at Germanium and Silicon surfaces form the subject matter of a chapter by D. R. Turner. Oxidation reactions of these two elements have been reviewed by J. I. Carasso and M. M. Faktor, and chemical etching of semiconductors by B. A. Irving. Practical applications of electrolytic treatments and of chemical etching have been discussed in the last two chapters by J. I. Pankove and P. J. Holmes

All through the book nomenclature and symbols recommended by CITCE have been used. In a few cases where the terminology is not yet fixed, the terminology of the semiconductor field has been employed. In general, there is little room for confusion regarding this aspect. Each chapter ends with a valuable list of references to the literature.

This publication is bound to be useful to solid-state physicists, chemists and technologists, particularly those interested in semiconductor research or development.

— C.N.R.R.

Ion Association, *by* C. W. DAVIES, published by Butterworths and Co. (Publishers) Ltd., London, 1962, 190 pages, 40 sh.

This book contains fifteen chapters in addition to a useful appendix, giving the pK values of ion-pairs in aqueous solution. In the introductory portion, after discussing the work of Debye-Huckel and Onsager, the author refers to Bjerrum's investigation leading to the concept of ion association. The need for the correct approach to the study of ion association is rightly emphasized here. In the next 60 pages of 5 chapters, the author discusses the various methods of studying ion association, such as conductivity methods, activity measurements, spectrophotometric methods, electrometric measurements and other methods. The results of ion association in water, mixed solvents and non-aqueous solution which are fairly numerous are then discussed in the next three chapters comprising of nearly 35 pages.

The theoretical problems that have been uncovered as consequences of ion association are then discussed in the next six chapters. The dissociation minimum and the conditions for the same along with conductivity evidence are dealt with. Colloidal solutions and colloidal electrolytes are then considered followed by thermodynamic properties, such as heat and entropy changes in the dissociation of ion-pairs. Kinetics and mechanisms of reactions involving ions and ion-pairs are then treated in a detailed manner both with regard to organic and inorganic reactions. The solvation of ions and ion-pairs are presented based on studies of electrolytic transfer of water, ionic mobilities and equilibrium properties. The structure of water is discussed at this stage. Theories of ion association are then gone into, comparing Bjerrum's theory with experiments.

The present book is an up-to-date account of the advances in the field of ion association. The account given is a remarkable case of consistent and careful approach necessary for establishment of a theory by experimental results. The behaviour of electrolytes from the standpoint of Bjerrum's theory explored by examination of many systems, over the widest concentration ranges, using many different physical methods to identify and characterize the ion-pair, is dealt with thoroughly and is bound to be useful background for those interested in talking up work relating to this field.

The book is unique for clarity and logical approaches to various aspects dealt with.

— H. V. K. U.

Physical Chemistry, *by* G. H. Duffey, published by McGraw-Hill Book Co. Inc., New York-Toronto-London, 1962, 527 pages, 68 sh.

The book comprises of nineteen chapters. Of these, the first six deal with phenomena pertaining to molecular and atomic structures. The next eight deal with thermodynamics and its applications. The last five chapters are devoted to electrochemistry, reaction kinetics and photochemistry.

The subject matter of the first six chapters is dealt with in quite a simple, easy-to-grasp fashion and in a more detailed manner than is generally found in Physical Chemistry books of comparable size. The inclusion of these details would have been more justified had it been utilised to a greater extent in the development of subject matter of the subsequent chapters. As it is, this subject matter of the earlier chapters seeme unrelated to the later chapters.

The chapters on thermodynamics and some of its applications deal with the topic more or less in the conventional manner, but with the addition of a small section devoted to the evaluation of properties of gases on statistical basis. The physical concepts of the various thermodynamic functions are not dealt with in good detail. Among these chapters, the one on "Thermodynamic Changes Accompanying Chemical Reaction' has been well presented and can be of considerable assistance to students in understanding the methods employed for assessing the thermodynamic feasibility of a chemical reaction.

The author's idea of putting the subject matter of chapters 16 and 17 under two heads is a welcome feature. The value of chapter 18 would have been considerably enhanced if it had contained procedures for determining the rate-controlling steps and the corresponding equations for catalytic reactions.

In general, this book has successfully dealt with considerable subject matter in a small space, and the exclusion of certain details can be considered justified and inevitable. The book is bound to be of immense use to that group of students who have had an initial physical chemistry course and are being initiated to advanced courses in the subject.

— G.N B.

A Guide to Corrosion Resistance, *by* J. P. Polar, published by Climax Molybdenum Co., Inc., New York, 1961, 270 pages.

This guide has been prepared in order to help the materials or corrosion engineer in the selection of the proper matterial from the viewpoint of corrosion resistance. It covers the following 5 types of alloys generally used in chemical plants: (*a*) 304 - 18/8 chromium-nickel, (*b*) 316-18/8 with 2-3 per cent molybdenum, (*c*) 317 - 18/8 with 3-4 per cent molybdenum, (*d*) " 20 " - 29 nickel/20 chromium steel with molybdenum and copper, (*e*) Ni - O - nel - 42 nickel / 21.5 chromium alloy with molybdenum and copper.

The corrosion resistance of each alloy is given under commercial conditions in commercial media as well as in chemically pure reagents. The data are presented in each case under corrosion medium, test conditions and average corrosion rates. The conditions include industry-process, type of test, temperature, duration, aeration and agitation. The publishers deserve to be congratulated for this yeoman service to the industry in compiling these data. The book will no doubt serve as a very valuable guide in the choice of corrosion resistant materials to the chemical engineer, metallurgist and corrosion engineer.

— T.L.R.

Copper and Copper Alloy Plating, *by* R. Pinner, published by Copper Development Association, London, CDA Publication No. 62, 1962, 213 pages.

The CDA is doing very good service to the industry by bringing out publications on the chemistry, metallurgy and uses of copper from time to time. This book is the latest of the series. It deals with the technology and to some extent the electrochemistry of the subject.

The subject matter of this book has been divided into 20 sections. After the introduction, the next 5 sections deal with the applications of copper plating, preparation of basis metal and the plating of copper from different baths. It not only covers the well established baths but also those which have proved commercially suitable *e. g.*, fluoborate and phyrophosphate.

Section 9 gives in detail the plating of brass, and includes the pyrophosphate bath. Alloys of copper with tin and other metals have been dealt with in sections 10 and 11. The next 3 sections cover the chemical deposition of copper, anode behaviour and after-treatment of deposits. Section 15 outlines special plating procedures of industrial importance, namely, the deposition on basis metals like stainless steel, zinc-base alloy, aluminium and other modern metals, and on non-metallic surfaces. The electroforming and electrotyping of copper are described in the 16th section.

Section 17 deals with the properties and different methods of testing of copper and its alloys. Chemical analysis and control of plating solutions are covered in section 18. The last two sections cover plating rejects, stripping of deposits and health hazards. Section 20 is followed by a small appendix which gives some useful plating data. References to recent literature are included at the end of each section. The subject matter is adequately supplemented with tables and figures.

The information given in this book is not only useful to the practical electroplater, but will also be of great value to the chemist, metallurgist and engineer.

— S. V.