BOOK SECTION

New Publications

Symposium on Electron Metallography, published by the ASTM, Special publication No. 262, 1960, 128 pages.

Proceedings of the Fourth International Conference on Ionization Phenomena in Gases, Uppsala, 1959, by N. R. Nilsson (Ed), Vol. I, 551 pages, Vol. II, 659 pages, 1960, published by North-Holland Publishing Co, Amsterdam, $ 34-50.

Report on Marine Atmosphere Exposure of Galvanic Couples involving Magnesium, by A. Gallaccio and I. Cornet, published by the ASTM, Philadelphia, 1960, 26 pages, $ 2-25.

Transactions of the Vacuum Metallurgy Conference, 1959 by R. F. Bunshah (Ed), published by Associated College Presses, New York, 1960, 212 pages, $ 7-50.

Corrosion Problems of the Petroleum Industry, SCI Monograph No. 10, published by the Society of Chemical Industry, London, £ 1 sh 10.

A History of Metals. Vols. I and II, by L. Aitchison, published by Macdonald and Evans Ltd., London, 1960, 690 pages, 168 sh.

The Surface Chemistry of Metals and Semiconductors, edited by H. C. Gatos with the assistance of J. W. Faust Jr. and W. J. La Fleur, published by John Wiley and Sons Inc., New York, 1960, 526 pages, $ 12-50. Electrochemical Society Series.

Anti-Corrosion Manual 1960, published by Corrosion Prevention and Control, London, £ 3.

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High Temperature Technology, by Stanford Research Institute, proceedings of an International Symposium held at Asilomar, Calif, October 1959, published by McGraw-Hill Book Co., London, 1960, 348, pages, $ 5 16 sh 6 d.

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Third Metallurgy Symposium on Corrosion, Aqueous and Gaseous, published by North-Holland Publishing Co., Amsterdam, in French, 239 pages, $ 10

Korrosion 12, Proceedings of the Second Congress, European Corrosion Federation, Frankfurt a.m., May-June 1958, published by Verlag Chemie, GMBG, Weinheim, Germany, in German, 1960, 264 pages, DM 36.

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Progress in Dielectrics, Vol. 2, by J. B. Birks and J. H. Schulman (Editors), published by John Wiley and Sons, New York, 1960, 225 pages, $ 9-50.

Design for Metal Finishing, to be published by the Institute of Metal Finishing, London, 5sh.

Frequent Types of Metal Corrosion and their Prevention, by G. Schikorr, published by K. Wittwer, Stuttgart, Vol. 3 of a series, in German, 1960, 146 pages.

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Wiggin Nickel Alloys, No. 57, 58, 1960, Henry Wiggin and Co., Birmingham.

Journal of the Indian Institute of Science, Vol. 42, No. 3, 4, 1960, I. I. Sc., Bangalore.

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ZDA Abstracts, Vol. 18, No. 7, 8, 1960, ZDA, London.

CSIR News, Vol. 10, 17-22, 1960, CSIR, New Delhi.

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Battelle Technical Review, Vol. 9 No. 8-10, 1960, Battelle Memorial Institute, Columbus, Ohio, U.S.A.

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Review of Metal Literature, Vol. 17, No. 8, 9, 1960, American Society for Metals, Novelty, Ohio, U.S.A.

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Metallic Corrosion Inhibitors, by I. N. Putilova, S. A. Balezin and V. P Barannik, published by Pergamon Press, London, Oxford, New York, Paris, 1960, 196 pages, 63 sh. Translated from the Russian by G. Ryback, edited by E. Bishop.

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BOOK REVIEWS

Metallic Corrosion Inhibitors, *by* I. N. Putilova, S. A. Balezin and V. P. Barannik, translated from the Russian *by* G. Ryback, edited *by* E. Bishop, published *by* Pergamon Press, London, Oxford, New York, Paris, 1960, 196 pages, 63 sh.

The use of corrosion inhibitors is one of the important methods of preventing the corrosion of metals and this publication covering the theory and practice of application of corrosion inhibitors is a welcome addition to the existing literature on corrosion and its prevention. The publishers have to be congratulated in bringing out the English version of the Russian text.

Beginning with an introduction the book is divided into six chapters. The first chapter deals with the classification and efficiencies of inhibitors under different conditions and includes mixtures of inhibitors and mixtures of inhibitors and corrosion accelerators. The next chapter discusses the mechanism of inhibitor action in fair detail from the viewpoint of adsorption, polarization and film formation. Although a good attempt has been made to emphasize the important aspects the problem is far from clear. As stated by the authors, " the controversy, however, continues to the present time ". This is an extremely difficult subject and it is not easy to draw rigid classifications. It would have been better if this portion had appeared after chapter 5 or in the end, since a knowledge of the performance of inhibitors for the corrosion of metals in different media provides a better background for a discussion on the mechanism of their action. Inhibitors in acid medium have been dealt with elaborately in chapter 3. The next chapter covers corrosion in alkaline medium, and the information available is rather meagre particularly for metals like aluminium which are finding

greater use today. Chapter 5 deals with corrosion in neutral medium and in the atmosphere; the treatment on the latter topic is quite good. The last chapter discusses inhibitors in non-aqueous liquid media. The inclusion of this topic is a welcome feature, since information is not readily available. There are 5 appendices describing the practical applications.

The general presentation of the subject matter is fairly good. The first five chapters are well illustrated with figures and tables and 2 indices have been included in the end. There are exhaustive references at the end of each chapter with emphasis on Russian work. However, the initials of the authors and the year have not been given in some cases. It is difficult to make out the name of the journal or publication from 'C' as in page 70 reference 62. In addition to the review papers 12-14 mentioned on page 124, a reference could have been made to that of G. T. Colegate (Metallurgia, 39, 316, 1949). There are a large number of typographical errors. Figures 18 and 22 are missing. The price is rather high as stated in the publishers's notice.

Several inhibitors found to be sucessful in the U.S.S.R. have been cited but their composition has not been given. This is one of the drawbacks from the viewpoint of industrial application. The chief value of this venture lies in the presentation, in a concise monograph, of important data on corrosion inhibitors. The publication will be more useful to research workers and industrialists, and less so as a textbook. It can be recommended to all those that are interested in the prevention of the corrosion of metals.

—T. L. R.

Beryllium, *by* G. E. Darwin and J. H. Buddery, published *by* Butterworths Scientific Publications, London, Metallurgy of the Rarer Metals No. 7, 1960, 392 pages, 70 sh.

'Beryllium' is the latest monograph in the series "Metallurgy of the Rarer Metals", published by the Butterworths Scientific Publications, London. The authors of this monograph present a thoroughly up-to-date collection, assimilation and arrangement of the available information on this metal. Though 80 per cent of beryllium's end use is still as an alloying addition to other metals, chiefly copper, its recent interest is because of its applications in nuclear engineering. The authors have done well in presenting a concise and precise account of beryllium in its various aspects.

There are a dozen chapters with an appendix. The first chapter covers the occurrence, world resources and uses of beryllium. The second, third and fourth chapters summarize the different extraction methods of the metal and its oxide. The fifth chapter deals with fabrication, the sixth, seventh and eighth chapters cover the physical and mechanical properties and chemical reactivity of beryllium, whereas the next two chapters discuss the metal as an alloying element. Nuclear properties, including the application in reactors and in radiation damage are presented in chapter eleven. The final chapter outlines health hazards and their control.

The book is very readable, informative and up-to-date. It will be a valuable addition to all libraries, and will be particularly useful to those engaged in beryllium research.

—R. M.

General Chemistry, *by* R. M. Whittaker, published by Chemical Publishing Co., Inc., New York, 1959, 751 pages, $12.50.

In general, the book is divided into physical, inorganic and organic chemistry. General concepts of physical chemistry have been dealt with first, followed by elaborate treatment of inorganic chemistry. The elementary introduction to organic chemistry found in the last two chapters, is an addition to the volume for its completeness. This book consists of 33 chapters, the first six being specially written for students who are just fresh from high school. Chapters 19 to 30 trea in detail the elements of the periodic table in a systematic way. The chapter on electrochemistry has been written well covering a wide field in a brief manner. Faraday's laws, pH determination, dry and storage cells, corrosion are some of the topics dealt with. This is an excellent addition to the existing ones and can be safely recommended for the first year chemistry course in the college level.

—J.S.

Progress in Metallurgical Technology, published for the Institution of Metallurgists, London by Iliffe and Sons Ltd., London, 1960, 147 pages, 25 sh.

This publication covers the lectures delivered at the 13th Annual Refresher Course arranged by the Institution of Metallurgists during 1959. The Institution's Refresher Series are well known, and these lectures have been delivered by competent metallurgists. The sponsors and the publishers deserve to be congratulated in making available the subject matter in book form.

The volume consists of 4 papers—modern developments in iron and steel production, extraction and refining of nonferrous metals, melting of ferrous and non-ferrous metals and casting of ferrous and non-ferrous metals. The topics chosen for this Refresher are all of importance in

modern metallurgical practice and the treatment is excellent. The matter is well supplemented with tables and figures, and papers 2 and 4 contain recent references for further study. There is a subject index in the end. This monograph can safely be recommended for reference to metallurgists.

—T.L.R.

Demineralization by Electrodialysis, *by* J. R. Wilson (Ed), published by Butterworths Scientific Publications, London, 1960, 378 pages, 60 sh.

A fascinating account of the successful project launched by a research team working in the National Chemical Research Laboratory of the South African Council for Scientific and Industrial Research, Pretoria, on the demineralization of brackish water by electrodialytis method, is delineated in the book under review. Electrodialysis as a unit operation has been accomplished as a result of the cumulative practical knowledge and experience gained by a group of chemists, chemical engineers and engineers working over a period of six years with the sole object of desalting of brackish water encountered during mining operations. A plant designed to deliver 100,000 gallons of desalted water per hour has been successfully worked out and this undoubtedly heralds as a landmark in the history of the application of electrodialysis which received a stimulus with the application of ion exchangers in sheet form in the study of the electrodialysis process.

The monograph is roughly divided into two major parts and consists of eight chapters. The first part deals with the membranes and the latter part chiefly deals with electrodialysis plant. The fundamental physico-chemical principles and engineering aspects of electrodialysis are clearly described in the first chapter. The physical chemistry of ion selective membranes and a good account of membrane preparative methods are given in the second and third chapters. The fourth and fifth chapters contain an account of the preparation of parchment-based membranes and characterization of membranes for use in electrodialysis. The design and operation of electrodialysis plant, pilot plant operation in South Africa and the working of 100,000 gallons per hour F.S G. electrodialysis plant, are dealt exhaustively in chapters six, seven and eight respectively. The bibliography at the end provides references to a large number of original publications.

Thus in about 350 pages a comprehensive review of the successful scheme is presented by a group of scientists and engineers working on it. For the first time the monograph provides all the working details of a technical record of the various stages of development: laboratory, pilot plant and full scale, of this unique project. This achievement promises a greater opportunity for the development of new territories which would have otherwise remained 'backward' owing to the lack of drinking and farming water, even though they may be very near to the sea.

—A.R.V.

Use of Non-Aqueous Solvents in Inorganic Chemistry, *by* C. C. Addison, published by the Royal Institute of Chemistry, London, Lectures, Monographs and Reports, 1960—No. 2, 25 pages, 4 sh. 6 d.

This monograph is based on a lecture delivered to the London Section of the Royal Institute of Chemistry in Jan. 1960. While going through the monograph, one gets an impression of many possibilities of new developments in the field of inorganic chemistry by the use of non-aqueous solvents. It may be pointed out, as an example, hat compounds like cupric nitrate and cupric perchlorate show unusual properties when prepared from an anhydrous medium. The contents in the publication are extremely interesting and exceptionally revealing. The author has not only dealt with the recent developments but also given the directions in which applications of non-aqueous media are likely to develop in the future. The topics covered are: the effect of variation in experimental conditions; factors influencing the choice of a solvent; solution of metals in liquid ammonia and ethers; use of mixtures of non-aqueous solvents; anhydrous copper nitrate and solvates. The author has also included molten salts as it is an expanding branch of inorganic chemistry under nonaqueous solvents. The rapid developments of interest by the use of molten salts are stimulated due to the needs of high-temperature technology, especially, in the field of nuclear energy. Reactions, solubility of metals, spectroscopy and chromatography in molten salts are the topics considered.

Data on the physical properties and uses of non-aqueous and molten solvents are tabulated. The author has covered recent literature including some that are published during the current year. It is hoped that the monograph will make a stimulating reading to the student, the teacher and the research worker in the field.

—C.C.P.

Industrial Finishing Year Book 1960, Published by Arrow Press Ltd., London, 296 pages, 15sh; free to Subscribers for Industrial Finishing.

The publishers of Industrial Finishing Journal

are bringing out this year book every year, and the 1960 edition is a welcome publication. This handy volume covers the whole field of industrial finishing, and the information is grouped under various headings in tabular form. The first few pages are devoted to workshop practice including safety, handling materials etc. The technology section includes protection, cleaning, polishing, electroplating, metal colouring, wood finishes, paint data and paint application. Under Technical Data official finishing specifications are listed. Buyers' guide and Trade directory, a list of professional institutions and trade associations are included. This volume will be quite useful for all engaged in the field of metal and wood finishing.

—S.K.

Principles of Chemistry, *by* L. A. HILLER, Jr. and R. H. HERBER, published by McGraw-Hill Book Co Inc., New York, Toronto, London, 1960, 435 pages.

"No single text can cover all of the topics pertinent to the field of general chemistry. Selection of topics has been made as a result of experimentation with courses in general chemistry taught at the University of Illinois to students in chemistry, physics, engineering and premedical course and related curricula". This text book, according to the authors, has been written for students taking the kind of course mentioned above.

The book is divided into two major parts - the properties of chemical substances and the dynamics of chemical change. Part I consists of nine chapters: review of fundamental concepts, the covalent bond, ionic bond, the solid state, the kinetic theory of gases, liquids and changes of state, organic chemistry, inorganic compounds and their reactions and the properties of metals. Part 2 is divided into seven chapters: the nature of chemical equilibrium, heterogenous equilibria and the properties of solutions, ionic equilibria in aqueous solutions, chemical thermodynamics, oxidation-reduction reactions, chemical kinetics and catalysis, and radiochemistry and the nuclear properties of matter. A short review of mathematical operations is included as an appendix apart from an index. To stimulate the student's interest in current topics in chemistry a selective bibliography has been added. At the end of each chapter questions and problems have been included to enable the student to check his mastery over the subject.

This text book on chemistry which maintains the quality of printing and format typical of McGraw-Hill publications will be invaluable to the students preparing for pre-professional courses to have a grasp of the principles in inorganic, organic and physical chemistry.

—S. K.

(*Continued from page 14*)

um metal by fused salt electrolysis. Chlorine is a valuble byproduct.

In conclusion it may be pointed out that the development of electrochemical industries as described in this contribution with sea water as the starting material offers solutions to the problems associated with the economical production of many heavy chemicals.

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