Book Section

New Publications

1969 Book of ASTM Standards. Part 32. Chemical Analysis of Metals : Sampling and Analysis of Metal Bearing Ores, published by American Society for Testing and Materials, Philadelphia.

Proceedings - Symposium on Recent Developments in Non - ferrous Metals Technology - 1968, published by National Metallurgical Laboratory, Jamshedpur, Volumes 1 and 2.

Constitution of Binary Alloys, by F. A. Shunk, published by McGraw-Hill, Inc., New York, 1969, 720 pages.

Electronic Structure of Atoms and Molecules, Volume 3 of Physical Chemistry, by D. Henderson (Ed), published by Academic Press, New York and London, 1969, 612 pages, $22.60.

Electron Probe Microanalysis, by A. J. Tousimis and L. Marton (Ed.), published by Academic Press, New York, 1969, 450 pages, $22.50.

Air Pollution, by A. C. Stern (Ed.), published by Academic Press, New York, 1968, 2nd ed.; Volume 1-Air Pollution and Its Effects, 694 pages, $32.50; Volume 2-Analysis, Monitoring and Surveying, 684 pages, $35 ; Volume 3 - Sources of Air Pollution and Their Control, 894 pages, $47.50.

Methods of Molecular Quantum Mechanics, Volume 2, by R. McWeeny and B. T. Sutcliffe, Theoretical Chemistry : A Series of Monographs, published by Academic Press, London - New York, 1969, 308 pages,84 sh.

Handbook of Inorganic Chemistry, GMELIN, System No. 50 Tantalum - Part A, Section 2, published by Verlag Chemie GMBH, Weinheim, Germany, 1969, 298 pages, $95 approx.

Adhesion Fundamentals and Practice, published by Maclairen, London, 1969, 308 pages, 130 sh.

Electroslag Refining, by W. E. Duckworth and G. Hoyle, published by Chapman and Hall, London, 1969, 80sh.

Praktische Galvanotechnik, published by Eugen G. Leuze Verlag, Saulgau/Wurtt, Germany, 1970, 550 pages, DM 58.

Differential Thermal Analysis, Volume 1 - Fundamental Aspects, by R. C. Mackenzie (Ed.), published by Academic Press, London and New York, 1969, 770 pages, 240 sh.

Heavy Deposition of Copper, Nickel and Chromium, by J. D. Greenwood, published by Robert Draper Ltd, Teddington, Middx, England, 1970, 216 pages, £5.

Non-Ferrous Extractive Metallurgy in the United Kingdom, by W. Ryan (Ed.), published by the Institution of Mining and Metallurgy, London, 234 pages, $14.40.

Van Nostrand Reinhold Co., New York - London, 1970 : (1) Chemical Engineering Catalogue, $40 ; (2) Chemical Materials Catalogue, $25 ; (3) Plastic Product Design, by R. D. Beck, $14.95 ; (4) Chemistry of Complex Equilibria, by M. T. Beck, 75 sh ; (5) Calorimetric Methods of Analysis, Volume IV AA, by F.D. Snell, $18.50 ; (6) Introduction to Properties of Materials, by D. Rosenthal, 2nd Ed., $11. Asia Representative : W. D. TenBroeck, C - 57, Defence Colony, New Delhi-3.

Modern Aspects of Electrochemistry-5, by J.O'M. Bockris and B. E. Conway (Ed.), published by Butterworths, London, 497 pages, 176 sh.

Proceedings of Conference on 'Stainless Steels for the Fabricator and User', published by the Iron and Steel Institute, London, 1969, 214 pages, £7.

Proceedings - Third International Lead Conference, Venice, 1968, published by Pergamon Press, 1970, 462 pages, £7.

Science and Society, by H. Rose and S. Rose, published by Penguin Press, London, 1969, 312 pages, 50sh.

Acids and Bases : Their Quantitative Behaviour, by B. P. Bell, published by Methuen, London, 1969, 120 pages, 26sh.

Coordination Compounds, by S.F.A. Kettle, published by Nelson, London, 1969, 230 pages, 35sh.

Plastics Materials, by J. A. Brydson, published by Iliffe Books, London, 1969, 610 pages, £6 sh 15.

Hackh's Chemical Dictionary - 4th Edition by J. Grant (Ed.), published by McGraw – Hill Book Co., New York, 1969, 738 pages, $29.50.

Eleventh International Conference on Coordination Chemistry, Plenary Lectures - IUPAC, Jerusalem and Haifa, 1968 ; published by Butterworths, London, 131 pages, 60sh.

Publications Received

Metal Finishing, Vol. 67, No. 12, 1969; Vol. 68, No. 1, 2, 1970; Metals and Plastics Publications, Inc., Westwood, N. J., U.S.A.

Australasian Corrosion Engineering, Vol. 13, No. 11, 12, 1969, Vol. 14, No. 1-3, 1970, North Sydney, N.S.W.

Metals Engineering Quarterly, Vol. 9, No. 4, 1969; Vol. 10, No. 1, 1970; American Society for Metals, Metals Park, Ohio.

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Lead Abstracts, Vol. 9, No. 10-12, 1969; Vol. 10, No. 1, 1970; LDA, London through Indian Lead Zinc Information Centre, Calcutta.

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Australian Chemical Engineering, Vol. 10, No. 11, 12, 1969; Vol. 11, No. 1, 2, 1970, North Sydney, N. S. W.

Inco Nickel, No. 26, 1970, International Nickel, London through International Nickel (India) P. Ltd., Bombay.

Journal of the Electrochemical Society of Japan, Vol. 37, No.3, 1969, Tokyo.

Chemical Age of India, Vol. 21, No. 2-4, 1970, Technical Press Publications, Bombay.

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American Reporter, Vol. 20, No. 5-10, 1970, US Information Service, New Delhi.

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Science and Engineering, Vol. 23, No. 2-4, 1970, ISE, Calcutta.

Cobalt, No. 45, 1969, Cobalt Information Centre, Brussels.

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Platinum Metals Review, Vol. 14, No. 1, 1970, Johnson Matthey & Co. Ltd., London.

Galvanizers Bulletin No. 6, 1970, Indian Hot Dip Galvanizers Association, Calcutta.

Metal Finishing Journal, Vol. 15, No. 180, 1969; Vol. 16, No. 181, 182, 1970; Fuel and Metallurgical Journals Ltd., London.

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Corrosion Prevention and Control, Vol. 16, No. 6, 1969; Scientific Surveys Ltd., London.

Galvanotechnik, Vol. 61, No. 1-3, 1970, Eugen G. Leuze Verlag, Saulgau/Wurtt, Germany.

Products Finishing, Vol. 34, No. 4-6, 1970, Gardner Publications Inc, Cincinnati, Ohio, U.S.A.

The Technology of Commercial Electrodeposition, by D. J. Stroud (Ed.), published by Royal Melbourne Institute of Technology, Melbourne, 1969.

Centre Calling, Vol. 4, No. 11, 12, 1969; Vol. 5, No. 1, 2, 1970, Govt. of India, New Delhi.

Endeavour, Vol. 29, No. 106, 1970, Imperial Chemical Industries Ltd, London.

Industrial Finishing, Vol. 22, No. 259, 260, 1970, Wheatland Journals Ltd., London.

wiggin Nickel Alloys, No. 95, 1969, Henry Wiggin & Co. Ltd., Hereford, England.

Anti - Corrosion Methods and Materials, Vol. 17, No. 1, 2, 1970, Sawell Publications Ltd., London.

Concise Chemical Thermodynamics in SI Units, by J. R. W. Warn, published by D. Van Nostrand Co. Ltd., London, 1969, 132 pages, £1 sh 1.

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Transactions of the SAEST, Vol. 5, No. 1, 1970, Karaikudi.

Measuring Methods in Corrosion Protection - Proceedings of International Conference "Euromeskar", Prague, 1968, 3 volumes, published by Central Dept. of Mechanical Engineering of the Czechoslovak Scientific - Technical Society and the G. V. Akimov Research Institute for the Protection of Metals, Prague.

Journal of the Indian Institute of Science, Vol. 52, No. 1, 1970, Bangalore.

HTS Digest, Vol. 10, No. 1, 1970, 10th Year Special Issue, HAL Technical Society, Bangalore.

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Compass, Vol. 4, No. 4, 1970, Madras.

Alkaline Storage Batteries, by S. V. Falk and A. J. Salkind, published by John Wiley & Sons, Inc., New York, 1969, 1969, 656 pages, $32.50.

The Bridge, No. 7, 1970, Embassy of the Federal Republic of Germany, New Delhi.

OSU Research Review, Vol. 6, No. 5, 6, 1970. Research Foundation, Ohio State University, Columbus, Ohio.

British Steel, No. 8, 1970, British Steel Corporation, London.

Annual Report and Accounts 1968-1969, British Steel Corporation, London, 60 pages.

Electro Technology, Vol. 13, No. 6, 1969, Society of Electronic Engineers, Bangalore.

Products Finishing, 1970 Directory, published by Gardner Publications, Inc., Cincinnati, Ohio, U.S.A., Vol. 34, No. 6A, 1970, 416 pages.

Monthly News letter, Australasian Institute of Metal Finishing, Melbourne Branch, March, April 1970, Melbourne.

Instruments News, Vol. 5, No. 1, 1970, C. S. I. O., Chandigarh.

Book Reviews

Modern Electroplating, by V. I. Lainer, published for the U. S. Department of Commerce and the National Science Foundation, Washington, D. C. by the Israel Program for Scientific Translations, Jerusalem, 1970, 306 pages.

This is an excellent treatise on electroplating at an advanced level, laying greater emphasis on the fundamental rather than on the technological aspects. The author, translator and the publishing agency are to be congratulated for bringing out this volume.

There are 12 chapters on theory and practice - general problems; current and metal distribution on the cathode; surface preparation; electrolytic and chemical polishing; plating of copper, iron group metals, chromium, zinc and cadmium, tin and lead, silver and gold, platinum group metals, and alloys. A bibliography pertaining to each chapter is given in the end, and there are 17 tables and 153 figures. The matter is well presented throughout, with special reference to the electrochemical - metallurgical aspects. This book is strongly recommended for all those who wish to keep in touch with the recent trends in electroplating.

—T. L. R.

Alkaline Storage Batteries, by S. U. Falk and A. J. Salkind, published by John Wiley & Sons, Inc, New York, 1969, 656 pages, $32.50; sponsored by the electrochemical Society, New York.

This is a book, unique in its own way, on different systems of alkaline storage batteries such as nickel - cadmium, nickel - iron, silver - zinc, silver - cadmium, manganese - zinc, mercury - zinc, etc. There can be no two opinions on the usefulness of this publication to serve as a current reference source on most of the rechargeable alkaline batteries in use. It gives fairly extensive information on the basic design, manufacture, performance characteristics, charging and maintenance of different types of alkaline batteries. In addition, the authors

have, through a sustained effort, provided an impressive and comprehensive background on relevant aspects of electrochemistry and thermodynamics of the above alkaline battery systems. The book is useful not only for the researcher working in electrochemical fields, but for those associated in the manufacture of such battery systems for industrial and consumer use.

The introductory chapter gives an interesting account on the history of the battery development. In the second chapter a detailed description on meterials and manufacturing methods is given. The third chapter concentrates mainly on the theory and use of separators, spacers and membranes in various battery systems. The rest of the chapters, 4 to 8, are devoted to performance characteristics; charging and maintenance; uses and applications; electrochemical and engineering principles; preparation, properties and effect of electrolyte (KOH-solution) composition on cell performance.

The material included in this book is remarkably complete extending from certain areas of theoretical electrochemistry to the latest development in the technology of alkaline battery manufacture.

—B. K. B.

Plastics as Metal Replacements, by P. I. Smith, published by Scientific Publications (G.B.) Ltd., Broseley, Shropshire, England, 1968, 282 pages, 65sh.

Plastics promise worthwhile advantages in price and performance. No other group of materials offer such a unique combination of properties. Moreover their properties can very often be tailored to fit specific conversion processes and applications. Although plastics lack the high structural strength of steel, they are more than adequate for many of the purposes served by metal where the load imposed is below the yield point of the plastic part. The purpose of this book is "to start engineers thinking about some of the opportunities which plastics offer in streamlining the production of a wide range of goods and restyling products design so as to improve appearance, to utilise brighter and more permanent surface finishes and to take advantage of the high strength/weight factor of plastics to effect substantial economics in weight and size of products".

It contains 19 chapters: (1) Guide to Engineering Plastics, (2) Material Selection, (3) Moulded Parts, (4) Machined Parts, (5) Thermoformed Parts, (6) Extruded Parts, (7) Plastics Replace Metals in Building, (8) Plastics in Packaging, (9) Pipes and Pipe Systems, (10) Plastics in the Motor Industry, (11) Plastics in the Electrical Industry, (12) Plastics in Chemical Engineering, (13) The Field of Domestic Appliances, (14) Plastics for the Marine Engineer, (15) Plastics in Aircraft, (16) Plastics on the Railways, (17) Precision Engineering Components, (18) Plastics in Agriculture and (19) Plastics in Photography and Printing

The author gives an account of the properties and production methods of various plastics which are of major commercial importance. Only the most significan metal replacement applications are dealt with in detail and emphasis is placed on the types of plastic swhich the author considers most suitable for specific applications; properties are critically examined alongside the applications. The book is written in a simple style with a good number of tables and photographs. A bibliography given at the end has enhanced the usefulness of the book. This can serve as an introductory volume in the field of plastics as a substitute for metal.

—(Miss) M. S.

Papers presented at the Conference on Education, Training and Communication in Corrosion Control in Engineering - University of Sheffield, April 1969; published by the British Joint Corrosion Group, London, 61 pages, £1 sh 10.

This volume contains the proceedings of a Conference on the above subject held in 1969 under the sponsorship of the Institution of Corrosion Technology, British Joint Corrosion Group and Corrosion and Protection Association, U. K. The following papers were contributed: (1) The role of or Justification for the corrosion engineer, (2) The role of academic institutions in spreading knowledge of corrosion and protection, (3) Training for anti - corrosion maintenance of naval aircraft, (4) Qualifications for the corrosion engineer, (5) Communication of corrosion information to engineers, (6) The significance of corrosion data to the engineer and (7) Problems of dissemination of information. The valuable discussions on each have been recorded.

The ravages due to corrosion of metals are serious at the present time, and the role of the corrosion engineer in fighting the battle against corrosion has been rightly emphasized here. The training needed for the technologists and engineers has been discussed in detail, with special reference to the facilities available in the U.K. The significance of corrosion data and the important problem of dissemination of technical information have also been dealt with. This publication will no doubt be of use to all those concerned with corrosion and its prevention.

—T. L. R.

Chemistry of Complex Equilibria, by M. T. Back, Translated from Hungarian by R. A. Chalmers, (Ed.), published by Van Nostrand Reinhold Company, London (in Analytical Chemistry Series) 1970, 285 pages. £4 sh 10.

The author highlights the developments solution complexes, determination of the composition and stability of the species by Bodlander, stepwire formation of complexes by Niels Bjerrum, potentiometric investigation of complex equilibria by Jannik Bjerrum etc. These developments initiated the research on structural arrangement of atoms of compounds and brought about the connection between different branches of chemistry.

There is an extensive discussion of complex equilibria and equilibrium constants, the complex formation, numerical and graphical methods for calculation of complex stability constants. Experimental methods such as (a) optical (b) calorimetry, (c) liquid-liquid partition, (d) solubility measurements, (e) ion - exchange measurements, (f) miscellaneous methods for the determination of stability constants have been dealt in detail. Mixed ligand complexes of the type iMeAh + jMeBh hMeAiBj; $MeA_2 + MeB_2$; $MeA_3 + MeB_3$; $MeA_4 + MeB_4$ have been explained. Polynuclear complexes chapter throws light on general problems in the calculation of stability constants, formation of polynuclear complexes in the hydrolysis of metal ions etc. The effect of some factors like – pressure, temperature, dielectric constant, ionic strength and ionic medium etc. have been considered on the determining the stability constants of metal complexes.

Prof. M. T. Beck who worked with Prof. Jannik Bjerrum in 1960 – 61 has contributed this long needed advanced textbook, which covers all aspects – theory, practice and interpretation. There is a thorough discussion of experimental procedures and calculation methods for determination of chemical constants with stress on the chemistry of protonated, mixed – ligand, polynuclear and outer sphere complexes. This proves to be helpful in all ways to inorganic chemists, physical and biochemists and all interested in solution chemistry in teaching, industry, and research.

—R. P. D.

Orbitals and Symmetry, by D. S. Urch, Published by Penguin Books Ltd, Harmondsworth, Middx, England, Penguin Library of PhysicalSciences : Chemistry, 1970, 256 pages, £1.25.

This book deals with quantum mechanical calculations and symmetry concepts in a comprehensive way. They are of increasing importance in chemistry. This field is usually made highly complicated by a rigorous mathematical treatment of quantum chemistry. But in this book, no attempt either with quantum chemistry or with group theory. Such a simple and approximate calculations can be of great value in understanding many chemical phenomena, and in suggesting new lines for research. However, here an attempt has been made to describe the limitations imposed by approximate methods, so that the reader may have a critical appreciation of the worth of the calculations and also to prepare for more sophisticated types of calculation. It is hoped in this way that the reader will acquire the ability to do simple Huckel calculations and also to realise their limitations.

The matter is covered in 7 chapters : (1) Atoms, (2) Molecules, (3) Symmetry and Point Groups, (4) Character Table, (5) Chemical Bonding, (6) Visible and Ultraviolet Spectroscopy and (7) Molecular Vibrations and Crystal Symmetry ; with matrix multiplication in Appendix A and character table for point groups in Appendix B. Under each chapter a set of problems are given and answers to these are included at the end of the book.

This publication is intended to cover the normal content of honours degree course of the British Universities and certainly it serves the purpose. The price is rather high from Indian standards.

—(Miss) T. S. V.

Indian Lead - Zinc Information Centre, Calcutta: (1) Lead – Modern Applications of a Traditional Metal, 17 pages; (2) The Modern World of Zinc, 19 pages, 1970.

Lead and Zinc are important amongst the non-ferrous metals at the present time, and the two booklets contain useful information on the growth of consumption and applications. There are illustrations and statistical data including available figures for India.

—T. L. R.

1970 Products Finishing Directory, Volume 34, No. 6A, March 1970, published by Gardner Publications, Inc, Cincinnati, Ohio, U. S. A., 416 pages.

This Directory is well known and issued every year by the publishers of the monthly Journal "Products Finishing"–a household reference source in industrial finishing. It is divided into the following sections: product index, source listings, literature, tradenames and review; supplier addresses; reader service cards. As with the previous editions, the present volume will no doubt be of interest in the field of finishing, with special reference to American products and equipment.

—T. L. R.

Inorganic Energetics, by W. E. Dasent, published by Penguin Books Ltd, Penguin Library of Physical Sciences: Chemistry Series, Harmondsworth, Middlesex, England, 1970, 165 pages, £1.

The present book, published under the chemistry section of the Penguin Library of Physical Sciences, is primarily intended to cover the optional subject of honours degree course of British Universities. But it can interest any student of Inorganic Chemistry because of numerous apt examples and pertinent thermodynamic aspects which are usually lacking in general text books.

General terms like lattice energies, bond energies, ionization potentials, electron affinities, electrode potentials and entropy etc. are well reviewed, and the various factors which contribute to the magnitude of the energy changes which accompany a host of inorganic reactions is nicely elucidated by making use of thermochemical cycles of the Born – Hober type. In terms of thermodynamics, it is explained why the melting and boiling points of ionic crystals are higher than those of covalent ones. Good number of tables, a subject index and a few references for further reading are other highlights. The author should be congratulated on deciding to choose the S. I. units throughout and write the books in a simple, yet relevantly brief, manner and without involving uncomprehending mathematical terms.

The book would have been more useful if some questions and reactions were given at the end of each chapter, so that the student might make his own analyses of the energetics of these, with the help of data tabulated. Some more recent references and less price would have added to its popularity. As it is, the publication will serve its purpose, and will be welcome by the students concerned as well as the curious in Inorganic Chemistry.

—S. K. N.

Lenin and Science, Soviet Review, Vol. 7, No. 30, 1970, 47 pages; published by the Information Department of the U. S. S. R. Embassy in India, New Delhi.

This issue contains 2 articles outlining the impact of Lenin on science and scientific thought, with special reference to the Soviet Union. The first one "Lenin and Science" is by Keldysh, President of the U. S. S. R. Academy of Sciences, and is based on the lecture delivered at the Jubilee Session of the Academy held in Moscow during April 1970. The second is on "V. I. Lenin – – Scientist, Revolutionary and Statesman" by Rumyantsev, Vice-President of the Academy.

—T. L. R.

India Builds, published by the United States Information Service, New Delhi, 1970.

A pictorial report on American assistance to India's economic development is presented here, with reference to agriculture, health and family planning, education, transport, power and industry.

—T. L. R.

Nuffield Combined Science: (1) Teachers' Guide I, 411 pages; (2) Teachers' Guide III, 266 pages, (3) Pack I Activities, published for the Nuffield Foundation by Longman, London – Penguin Books Ltd, Harmondsworth, 1970.

With the increasing rapidity of scientific progress and the need for acquiring more and more knowledge to cope with the present day scientific standards, there is a great deal of pressure and need for a proper method of teaching, which can give maximum knowledge both by study and experimentation. Knowledge gained by experimentation is certainly of more value and utility. In providing the children with an incentive to learn from practice the Nuffield Combined Science volumes surpass any of the heretofore known publications. The suggestions made and the methods evolved are quite simple and practicable.

The activities pack I, consisting of 'Things in the world around us', 'How do animals move', 'How living things began', 'Air is all around us' and 'Electricity in action' cover many basic principles of chemistry, physics and biology'. The treatment is done in such a novel chit-chat fashion, that the children would never find it a text-book, but only a picnic in science, gaining much of the knowledge from observation and practice.

The teachers' guide I, which is meant for the teacher who deals with the activities pack I, is certainly necessary for the teacher who introduces the 'Activities' to his students, mainly because the various branches of science are ment to be taught by the same teacher. The suggestions for teaching and the experiences of a few teachers given, go more to help the teacher do what is expected of him.

Teachers' guide III where the 'Apparatus Index' and the 'Materials Guide' are given is certainly a help. In essence the system is certainly a creative advancement in the teaching of science which sure would evolve practical men with a 'thinking' habit.

—R. S.

British Steel Corporation, London – Annual Report and Accounts 1968 – 69, 60 pages.

The report for the year covers marketing, commercial, planning, finance and overseas activities; research and development production and related statistics for some of the largest steel producers in the U. S. A., U. K., Germany, Japan, Australia, Italy and France.

—T. L. R.

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