

Memorial Institute. For the past 11 years, he has been interested in nuclear materials. Most of his research has been on graphite, and he has published extensively in this field. Editor of a recent book, *Nuclear Graphite*, (Academic Press, 1962), he was a delegate to the 1958 and 1964 Geneva Conferences and has served as an advisor to the AEC on graphite problems on a number of occasions. Prior to his present position, he was a research associate at the University of Minnesota. He received a PhD degree (physical chemistry) from Washington State University in 1953 and a BA from Whitman College in 1949.

S. H. Bush is consultant to the Director of the Pacific Northwest Laboratory. He has spent the past 12 years in the field of nuclear materials, including irradiation effects, fabrication processes, and nuclear fuels. Major contributions include chapters in *Materials Volume of the Reactor Handbook*, papers at the Paris Fuel Element Conference in 1957 and Vienna Conference on Fabrication Processes in 1960, and the ASM-AEC Monograph, *Irradiation Effects on Cladding and Structural Materials*. Active on the Editorial Advisory Board of *NUCLEAR APPLICATIONS*, he received PhD (1953), MS (1950), and bsk (1948) degrees in Metallurgical Engineering from the University of Michigan.

NEWTON SHOULD SEE THIS!

Title Fission Product Yields and Their Mass Distribution

Authors Yu. A. Zysin, A. A. Lbov, and L. I. Sel'chenkof

Publisher Consultants Bureau Enterprises, Inc., 1965
(translated from Russian)

Pages 121

Price \$15.00

Reviewer Seymour Katcoff

This little reference book consists mainly of a collection of tables. These record the yields of products obtained from spontaneous fission and from the fission of heavy elements induced by neutrons, x rays, protons, deuterons, and alpha particles. Bombarding energies up to about 100 MeV are included. The tables are arranged in a clear and systematic way. It is convenient to have all the data of this kind collected from the literature into one place.

The virtues of this book are outweighed by several serious shortcomings. A great deal of obsolete and superseded data is included together with (and occasionally instead of) more accurate results. No distinction is made between values that appeared in earlier critical compilations and those given in original research reports.

Thus several values are frequently given for a single fission yield determination. In common with many other data compilations, this one also is rapidly becoming obsolete. The most recent references are dated 1962. A substantial body of new fission yield data has appeared since then. The coverage of the published literature up to 1962 is adequate; however, no reference at all is made to the many AEC reports and PhD theses. Inclusion of some data from obscure Russian sources in part compensates for this deficiency. Among the occasional errors found in this book, the most amusing appear in the tabulation of decay chains which was copied from a previous compilation: several nuclides are shown decaying to a rare gas isotope + Newton!

The \$15.00 price for this 121-page book is outrageous. Translation costs must have been at a minimum because less than 20% of the volume consists of text. The bulk of the data appeared in English originally. Certainly the talents and resources of Consultants Bureau could be better spent translating significant and original Russian books and periodicals.

Seymour Katcoff is a Senior Chemist in the Chemistry Department of Brookhaven National Laboratory, where he has been since 1948. A foremost authority on fission product radiochemistry, in general, and fission yield measurements, in particular, he spent the war years at the Metallurgical Laboratory, Chicago and at Los Alamos. His PhD degree (physical chemistry, 1944) is from the University of Chicago.

WORDS ON WASTE

Title Management of Radioactive Waste

Author C. A. Mawson

Publisher D. Van Nostrand Co., Inc., 1965

Pages ix + 196

Price \$6.95

Reviewer R. Louis Bradshaw

The author of this book is Head, Environmental Research Branch, Atomic Energy of Canada, Limited, Chalk River Nuclear Laboratories, a position which he has held since 1956. In both this and his previous positions he has been directly involved with waste management.

In the words of the author, "The object of this book is to describe, as far as possible in nontechnical language, the nature of the waste management problem, to show how this problem is being met at the present time, and to indicate the lines of development most likely to be followed in the future. . . It is hoped that this book will provide information suitable for preparing students for

entry into an interesting and rewarding profession. . .Some of the detail, and many of the references, given in these pages are directed more to the specialist than to the public or to the student. . .”.

In large measure the objectives appear to have been met. The book is well written, arranged in logical order, and covers the field adequately. The contents range from general principles of waste management, through sources and nature of wastes and handling of solids, liquids, and gases, to political and legal considerations. There are several minor technical errors in the book, but, in general, they do not seriously detract from nor distort the overall picture, which the author is trying to present. Perhaps the most noticeable defect in the book is one that it shares with most books that cover a rapidly advancing field: much of the technology, which is covered in the greatest detail, is now obsolete, or is rapidly becoming so. However, there are sufficient references to recent publications that the serious student can fairly easily locate the details of the more recent technology.

This book should be a valuable addition to the library of those who are professionally interested in some aspect of radioactive waste management, including those engaged in design and operation of waste disposal facilities, as well as those who are involved with the design or operation of facilities that produce radioactive wastes.

R. Louis Bradshaw is a member of the staff of the Health Physics Division at Oak Ridge National Laboratory, where for the past 14 years he has worked on research projects relating to radioactive aerosols, environmental monitoring, and disposal of highly radioactive waste. Since 1958 he has studied the use of natural salt formations for ultimate disposal of such solid waste from reprocessing power reactor fuel. At the present he is responsible for the experimental side of "Project Salt Vault", a demonstration disposal of highly radioactive solids in a Kansas salt mine. After he received his engineering degree from Auburn University in 1950, Bradshaw did graduate study at the University of Tennessee.

ATTENTION, REACTOR MANAGERS AND OPERATORS

Title Manual for the Operation of Research Reactors

Authors J. A. Cox, R. Skjoeldebrand, and C. N. Welsh

Publisher International Atomic Energy Agency, 1965

Pages xii + 194

Price \$4.50

Reviewer L. Kornblith, Jr.

If I were asked to prescribe a single book as required reading for the manager or operator of a research reactor, this would be the one. Further, I would require that he

reread it several times a year. In 194 pages, it identifies and discusses essentially all of the factors important to the safe and efficient operation of most research reactors. Although the manual is directed mainly toward light-water-cooled and -moderated research and test reactors and uses as examples ORNL experience and practices, the applicability of the principles discussed is considerably broader. No reactor operator, supervisor, or manager can read or reread this little book without benefiting from it. If I sound enthusiastic, I have conveyed the impression I intended.

The book consists of four major sections, including a 66-page group of appendices. The latter includes an outline of a reactor operations training course, an example of the ORNL experiment review questionnaire, and numerous samples of checklists, record forms, log sheets, and similar documents. These, while certainly not universally applicable, are extremely useful and demonstrate the philosophy and methods used at one large reactor center.

Part I is entitled "Operations". It deals with such subjects as staffing and training a reactor organization, planning for initial operation, and preparation of procedures for all aspects of both routine and abnormal operations. It also discusses extensively the essentials of good operating practices and the handling of emergency situations, using actual experiences as illustrative material. Fundamental approaches to an overall safety program are discussed.

"Experiments" is the subject of Part II. Safety evaluation of experiments is covered, as well as planning and operation of experiments. Various types of experimental facilities are described, and their particular areas of usefulness and limitations are discussed.

Part III covers "Functional Requirements of Reactor Systems". This section appears to me to have unusual value to operation managers during the planning phase of a new facility. It provides the background, and almost a checklist, for establishing the criteria to be presented to the group doing the actual design work. By using such material to formulate design criteria, the operating group can be assured that a facility will evolve that satisfies the operating needs—a situation which does not always exist when a facility is planned by designers without operating background. The material included here allows the planner to incorporate the experience acquired in the past by others with his own experience and reduces the number of overlooked areas.

In summary, the manual contains a great deal of extremely useful information for operators of existing reactors and for those planning new ones. It is aimed primarily at reactor managers and supervisors, but it has much information useful to and understandable by operators. It has some shortcomings, as does any other book, but these are minor. It is both a practical book and a practicable book, and it is highly recommended.

Lester Kornblith, Jr. is Assistant Director for Reactors, Division of Compliance, USAEC. Prior to assuming this position in 1963, he spent eight years at General Electric's Vallecitos Atomic Laboratory, where he had a key role in the

design, construction, and initial operation of the Vallecitos Boiling Water Reactor and was manager of the Reactor Technical Operation unit. Before joining GE, he spent nine years at the Enrico Fermi Institute for Nuclear Studies, University of Chicago, where he was Chief Engineer and was responsible for the design, construction, operation, and maintenance of a 170-inch synchrocyclotron. A graduate of MIT, he is currently Secretary of the Reactor Operations Division of ANS.

A LIMITED AID TO TRANSLATION

Title Dictionary of Nuclear Physics and Nuclear Chemistry

Editor Hans Rau

Publisher Reinhold Publishing Corp., 1965, second edition

Pages 350

Price \$8.75

Reviewer Hartmut Wiedersich

A rapidly expanding field such as nuclear science and technology creates a multitude of new and highly specialized terms. Thus, specialized and up-to-date dictionaries are desirable. The present German-English/English-German dictionary, an enlarged and revised edition of a previous one, was intended to serve this need. Despite the title, it appears primarily directed toward engineers concerned with reactor technology and uranium mining, since the areas of engineering, mining, and minerals are covered especially well.

However, some areas lack complete coverage. A quick check revealed as missing: exclusion principle, epithelial, laws of thermodynamics, parity, quadrupole, statistics, straggling, scavenger, and many more. Nevertheless, about 8000 terms (according to the preface) are included. The dictionary has limited value for engineers with interests in materials since few metallurgical and radiation damage terms are included. For example, some words from these fields, which are not found in the book include: anneal, forging, precipitation hardening, steel, knock-on, interstitial, thermal spike, and displacement spike.

In general, the translations are precise. Yet, it is news to me that "metallurgical engineering" is "Eisenhüttenwerk" (steel works) or that the deuteron has the atomic number 2. There are cases where additional translations should have been added, e.g. "dislocation" is given only as "Verlagerung" (geologic) but not as "Verseztung" (crystal defect).

An extensive section containing symbols and abbreviations is useful. The excessive employment of abbreviations in our time is reflected by this section which requires 80 pages—more than 20% of the volume. Whereas usually only the full name of an object is given

in the English column, frequently the item is characterized briefly in German. For example, BEPO reads British Experimental Pile Operation in the English column, while the German column contains the equivalent of: graphite-moderated, gas-cooled uranium reactor, 6 MW, in Harwell, Berkshire, England.

As with all specialized dictionaries, a good general knowledge of the language (or a general dictionary) is required for profitable use.

Hartmut Wiedersich, technical staff member of the North American Aviation Science Center's Theoretical Chemistry Group since the Center's inception in 1962, has been in research with Westinghouse Electric (1954-60) and Atomic International (1960-62) since receiving his PhD in Physics and Metallurgy from the University of Göttingen, Germany, 1954. His best-known scientific contributions are in the fields of plastic deformation and of applications of the Mössbauer effect to magnetic and metallurgic problems. He has co-authored a review article on radiation damage in reactor materials which will soon be published by ASTM.

GRACEFUL AND COMPENDIOUS

Title Electrodeposition and Corrosion Processes

Author J. M. West

Publisher D. Van Nostrand Co., Inc., 1965

Pages xii + 189

Price \$7.50

Reviewer Clemens Auerbach

The stated purpose of this short book is to present a unified picture of the processes of electrodeposition and corrosion in terms of the same basic phenomenon: the transfer of a metal ion through an energy barrier existing at a metal-electrolyte interface. The author approaches this task by dividing the subject matter into seven chapters. The first two chapters present, respectively, a concise treatment of equilibrium at a metal-solution interface and of departures from such equilibrium. These chapters introduce such basic topics as exchange current density, the structure of the double layer, the role of adsorption, and the influence of structural features of the metal surface. The third chapter turns to the treatment of electrochemical corrosion, about half of it being devoted to a discussion of the major types of cathodic processes. The related topic of surface films, leading up to the subject of passivity, is presented in the following chapter, which makes liberal and effective use of potential-pH (Pourbaix) diagrams. Chapter 5 consists of a discussion of electro-polishing and bright electrodeposition from the unifying viewpoint of random (noncrystallographic) dissolution and deposition. Chapter 6 deals systematically with corrosion prevention, and the final chapter gives an introduction to the complex and controversial field of phenomena involving stress. A few rather conventional numerical