

A USEFUL TREATMENT OF POORLY GROUPED TOPICS

Title Modern Materials: Advances in Development and Applications, Vol. 4

Editors Bruce W. Gonser and Henry H. Hausner

Publisher Academic Press, 1964

Pages xii + 420

Price \$15.00

Reviewers R. E. Nightingale and S. H. Bush

This book is the fourth in a series of volumes begun in 1958. The purpose of this series is to provide a convenient source of information for the materials-minded engineer that will enable him to keep abreast of this broad and rapidly changing field. The preceding three volumes contain a total of 21 chapters on topics ranging over the complete materials field.

Volume 4 contains chapters on "Carbon and Graphite", "Materials as Affected by Radiation", "Materials for Plain Bearings", "Solid Lubricants", and "High-Strength Constructional Alloy Steels". As in the previous volumes, the grouping of topics appears to be quite arbitrary except for Chapters 3 and 4. This is unfortunate because an engineer is usually reluctant to pay \$15.00 for a book containing only one chapter of prime interest; therefore such a book will usually be found only on the library shelf. It is hoped that an attempt will be made to group related topics together in future volumes.

The first chapter, "Carbon and Graphite", will very well serve the needs of the engineer looking for an introduction to the topic. The author of this chapter, Erle I. Shobert II, writes authoritatively and clearly. In a field that has seen many new carbon materials and applications evolve in the last few years, he maintains a balanced perspective of the important uses and developments. The chapter is pleasantly devoid of provincial terms; a nonspecialist will have no trouble understanding the language.

The discussions on friction, contact properties, sliding contacts, and brushes are particularly informative; there is a very good section on the use of carbon in the carbon arc, and the applications of graphite in rocket nozzles and nose cones is clearly and concisely summarized. A section on recent developments includes information on pyrolytic graphite, glassy carbons, graphite cloth, fuel cells, and new manufacturing procedures. Information as recent as mid-1963 is included.

The chapter is illustrated with a number of photographs, including two pages of sensitive-tint photomicrographs in color. In spite of a rather careful reading the reviewers found only a few typographical errors. Unfortunately the source of data in tables or statements in the text is not given so that it is not possible to locate easily a reference for additional information.

The second Chapter, "Materials as Affected by Radiation" by T. S. Elleman and C. W. Townley, accomplishes its purpose very well. The engineer wanting a broad view of the field can get it here in a few hours. Topics include the nature of radiation, the theory of radiation damage, a survey of effects on metals, ceramics, and organics, and some of the practical problems of studying radiation effects and handling radioactive materials. Typographical errors are almost nonexistent. Some of the sections are now several years out of date, notably those on radiation effects in graphite and organics, so one should not depend on this chapter as a source of current references. But with this reservation, this chapter is certainly one of the best introductions to the subject that the reviewers have seen.

Chapter III, "Materials for Plain Bearings" by P. G. Forrester, presents an excellent and current report on the field of bearing materials. A good balance is retained among the various types of bearings, and adequate coverage is given to properties and factors influencing selection of a bearing material. The chapter is very readable and quite free from typographical errors. The reference coverage is excellent, permitting the reader to explore fields of particular interest.

Chapter IV, "Solid Lubricants" by R. J. Benzing, presents a broad coverage of the field in a qualitative or semiquantitative fashion. It gives one a reasonably up-to-date picture of the state-of-the-art. The chapter should provide an excellent source of information to the reader with broad interests.

The final chapter on "High Strength Constructional Alloy Steels" by A. M. Hall, differs in several respects from the preceding chapters. The most obvious difference is in reference coverage. Whereas most other chapters had excellent reference citations, this one had a limited bibliography—and suffered from the lack. In the reviewers' opinion the justification for not including selected alloys from other countries was invalid, and their absence detracted from the chapter.

The initial criteria would appear to eliminate materials such as H-11 steel and some of the stainless steels; yet they are included. If one revises the ground rules to include these steels and the maraging steels, then some discussion of 'ausforming' would be justified.

Inevitably a topic of this magnitude will be somewhat cursory when compressed into 79 pages. Even so, the reader is given a broad picture of the low-alloy structural steels, precipitation-hardening stainless steels, and maraging steels, together with brief commentaries on properties, fabrication, joining, and heat treating.

In summary, the book contains some very useful chapters on a variety of materials. It is unfortunate that in this type of book, more closely related topics are not grouped together in one volume so that the individual engineer buying it would get more of interest for his money. Even so, this volume will be a useful addition to technical libraries.

R. E. Nightingale is manager of the Materials Research and Service Section at the Pacific Northwest Laboratory (formerly Hanford Laboratories) now operated by Battelle

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