For those who use reaction Q-values or need authoritative mass values, these two volumes are a very helpful reference work indeed.

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Reactor Handbook, Vol. I: Materials, 2nd ed., revised. Edited by C. R. TIPTON, JR. Interscience, New York, 1207 pp., $35.60.

As pointed out in the preface to this book, a staggering amount of materials data has been accumulated in the course of reactor development. The editor, the editorial review board, and the authors are to be commended for the judicious selection of information and for the organization of the presentation.

The book is organized along the lines of the functional utilization of the materials within a reactor. Following a general section, one section is devoted to each major category, i.e., fuel materials, cladding and structural materials, control materials, moderator (and reflector) materials, coolant materials, and shielding materials. A natural outgrowth of this categorization is the inclusion of gases and liquids as "materials." One might criticize this decision if the book is thought of simply as a "Materials Handbook," but as it is actually the "Materials Volume" of a "Reactor Handbook," one is forced to admit that it would be difficult to find a better place for this important information. The data provided on liquids and gases are those that are useful to engineers associated with reactors and it is convenient to have them brought together.

On the other hand, it seems unnecessary to have included chapters on "Health, Safety, and Accountability," "D_2O-H_2O Separation," and "Zirconium-Hafnium Separation."

The editor also points out in the preface his realization that interest in the field may shift from one area of technology to another, making the compiler's task doubly difficult. The subject matter of this book is, in general, current to about the spring of 1958, and since that time many changes in interest actually have occurred. Some items given emphasis in the book are no longer of importance, while others which are given very brief mention are now of great importance. For example, the chapter on ceramics which includes UO_2, UO_2-ThO_2, UO_2-PuO_2, UO_2 in graphite, and UC_2 in graphite is covered in only twelve pages; the uranium carbides are given one small paragraph in the chapter on carbides and cermets and not even a sentence in the chapter on ceramics. This type of defect is unavoidable in a compendium which naturally takes so long to publish and when it relates to such a fast moving area as nuclear energy.

On the whole, the book is an invaluable reference work. In addition to the well-written text, there are almost one thousand tabulations of data and over one thousand figures. Many phase diagrams are included and there are also thirty pages of references to selected binary phase diagrams of interest to the nuclear field. No metallurgical library can be considered complete without this volume.

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Nuclear Reactor Shielding. By J. R. HARRISON. Simmons-Boardman, New York, 1958. $2.75.

This small book (68 pages) is intended in the words of the author "to provide an introduction to the principles and practice of reactor shielding . . . to provide a short survey of the subject." It is intended for students and non-specialists who wish a general, broad picture of reactor shielding technology.

The first chapter is concerned with defining the problem, introducing the definition of flux, cross section, and current, and defining the units of radiation intensity and dose.

The second chapter concerns gamma ray attenuation. The various reactor sources are identified, the important gamma interaction processes with matter are discussed and the techniques of performing attenuation calculations are explained.

The third chapter performs the same function for neutrons. Chapter four enters into a discussion of shield design for pure gamma or neutron sources and outlines the procedures for designing a stationary reactor shield. Some of the important ideas associated with the design of light weight mobile shields are also discussed. Chapter five considers miscellaneous topics such as angular distributions, neutron streaming through ducts, and coolant activation.

Generally speaking the author is successful in reaching his goals. As a consequence, however, the treatment of most topics other than gamma ray attenuation is rather superficial. This is especially true in the latter portions of the book where mobile reactor shields, ducts, etc., are touched upon.

It would have been better, in this reviewer's opinion, to have deleted all reference to mobile reactor shields from this book. The inexperienced reader may well conclude that the simple calculational techniques discussed are adequate for the design problem. Such was not the case in 1958 and in fact shield physicists and engineers are only now learning to handle such matters as secondary gamma ray production and shield heating with any degree of confidence.

In addition to the theoretical advances in the past three years, there have been numerous changes in the data used for shielding calculations. The reader would be advised to consult a more recent compilation such as Goldstein's before initiating any calculation.

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