Radiochemical Survey of the Elements. Principle Characteristics and Applications of the Elements and their Isotopes. By M. Haïssinsky and J. P. Adloff. American Elsevier Publishing Company, New York (1965). 177 pp. $12.00.

This book presents nuclear, chemical, and physical data for each of the 104 elements in alphabetical order. The information varies from 7-½ pages for uranium to ⅓ page for lawrencium. Radionuclear properties are emphasized and include natural and artificial radioisotopes, typical nuclear reactions, cross sections, preparation of principal radioisotopes, and typical applications of these isotopes.

Generally the translation from French is good. An exception may be the second sentence in the introduction... "In fact, apart from about twenty elements all the isotopes of which are radioactive, all the remaining members of the periodic table possess several radioactive isotopes, natural or which have been produced in the laboratory."

Much of the information presented in the book in narrative form would be more effectively given in tables. In fact, these data are already available to all scientists in various periodic charts, especially those with nuclear data. The history of elements and their general chemical and physical data are also available in several chemical handbooks.

There are several errors as the authors predicted. Californium-252 does not emit 3×10^9 n/(sec g) as stated, but rather 2.4×10^{12} n/(sec g). Haïssinsky and Adloff also include data called either tolerance doses or maximum admissible doses of radioisotopes. These data appear to be taken from the 1951 International Committee of Radiation Protection recommendations. They are now badly outdated and differ in many cases by several fold from current recommended values for air, water, and whole-body burdens. Furthermore, maximum permissible concentrations for uranium are transposed.

Although all statements in a book of this type cannot be referenced, some general references for each element might be included. There is no reference to the maximum permissible concentrations or to any other data in the book.

The exact intended audience for the book is not given by the authors. Certainly most of the information is already available to scientists and students in wall charts and handbooks. More specialized or recent data may be in error as already indicated. Haïssensky and Adloff indicate they intend "to paint a portrait of each element," but 177 pages allow only vignettes.

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About the Reviewer: Mr. Butler holds a masters degree in chemistry from the University of South Carolina and has been engaged in radiochemical research since 1954 at the Savannah River Laboratory operated by Du Pont for the USAEC. His work has been in the separation and analysis of actinides, a part of his general interest in the analysis of trace nuclides in biological and environmental samples.

Nuclear Techniques in Analytical Chemistry. By Alfred J. Moses, International Series of Monographs on Analytical Chemistry, Vol. 20 (1965). 142 pp., $6.50.

Analytical chemistry has been advanced by, among other things, the development and application of nuclear techniques of great versatility, sensitivity, and dynamic range. Such techniques have gained acceptance by practicing chemists, and are being incorporated in chemistry course work from lower division to the graduate level. Although a number of books and review articles have treated the subject, the book *Nuclear Techniques in Analytical Chemistry*, by A. J. Moses, can serve as a short introduction to the subject.

The book consists of 10 chapters and 6 appendixes. The text is included in just 110 pages abundantly interspersed with tables and figures; thus, the entire book can be read easily at one sitting. The chapters are not even in quality, although most of them are well done.

The first chapter, a terse discussion on handling radioactivity safely, provides an awkward beginning. In the absence of a preliminary discussion of radioisotopes and their decay, the burden of definitions is too great for reasonably easy comprehension by a reader new to the subject. Furthermore, some terms are not defined until later chapters (e.g., half-life, decay scheme), and several important factors are omitted. For example, the list of rules governing laboratory practices does not include the necessity for monitoring of personnel.

The second chapter, which covers instruments, sources, and instrumentation is less terse, more readable, and reasonably informative within the space allotted. The reader may still experience some difficulty due to the abbreviated treatment afforded material that is new to him; this effect, however, is ameliorated in subsequent chapters.

The last 8 chapters are the better part of the book in terms of subject treatment and readability. They discuss the measurement of natural radioactivity, activation analysis, scattering and absorption techniques, radiometric techniques, the use of exchange reactions, age-dating, and several miscellaneous techniques. These chapters serve to indicate the scope of nuclear methods.

Despite the incorporation of some useful laboratory procedures, the reader should not expect the material to be treated in sufficient depth to allow direct applicability of these techniques. This is not the author's purpose, and references are given to more detailed works.

The power of the analytical techniques are not adequately described. Figures depicting those elements that can be detected at a level of 10 ppm with 10^9 n (at 14 MeV)/(cm^2 sec) and at a level of 100 ppm with 10^9 thermal n/(cm^2 sec) are given. Also, tables indicating isotopic yields to be obtained from the elements under defined conditions of irradiation are given. However, the associated analytical sensitivities, which in some cases are less than 10^{-12} g, are not discussed. Several examples of the sensitivity of radiometric techniques are given; but the relationship between specific activity and sensitivity is not explained.

Despite the inadequacies that are apparent, the reviewer must emphasize that the author has achieved his purpose, which is to acquaint the analytical chemist with nuclear techniques. It is quite likely that a more detailed and lengthy book would not serve this purpose as well.

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About the Reviewer: Mr. Dick Lukens graduated from the University of California in 1945. Since that time he has