

BOOK REVIEWS

Selection of books for review is based on the editors' opinions regarding possible reader interest and on the availability of the book to the editors. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.



Reference Methods for Marine Radioactivity Studies

(Technical Report Series No. 118, International Atomic Energy Agency, Vienna, 1970)

<i>Editors</i>	IAEA
<i>Publisher</i>	Unipub, Inc.
<i>Pages</i>	284
<i>Price</i>	\$7.00
<i>Reviewer</i>	Herbert L. Volchok

The impact of man's activities on the marine environment is a serious and often controversial subject, especially when trying to project the future. If one thing seems obvious, however, it must be that the use of the oceans as dumping grounds for wastes will have to be much more carefully controlled, and on an international basis. The means and methods for arriving at agreements for the regulation of this use of the oceans are complex but, hopefully, are approaching success through various international meetings. Once achieved, such regulations will undoubtedly have to be backed by controls; probably some sort of monitoring system for each of the categories of potentially harmful substances added to the seas. Consequently, we now must recognize the need for international "how to" books. *Reference Methods for Marine Radioactivity Studies* partially fulfills this need concerning the wastes of nuclear detonations and reactors: "how to" carry out radioactivity studies in the marine environment.

The book is the result of a study carried out by an *ad hoc* panel under the chairmanship of A. K. Ganguly of India. The panel consisted of nine members representing eight different countries (India, U.S.A., Yugoslavia, France, Norway, USSR., England, and Japan). Perhaps the most obvious recommendation for this book is the makeup of this panel. Undoubtedly the nine participants comprise a sizeable fraction of the scientists who have made significant contributions to the studies of man-made radioactivity in the oceans and who continue to be actively engaged in this work.

The main objective of the book, as stated by the panel, is "the application of methods and techniques to the practical problems of waste management in the marine environment." Its usefulness, however, is much more extensive in that the detailed coverage of the methods and techniques continue to have application to numerous other fields of science and engineering. The volume was designed to offer other workers a broad survey of the equipment and procedures actually in use in this field without attempting to recommend one or another. This is a very important and logical plan since the variety of research problems and available facilities often limit the investigator with respect to sample size, storage, etc. Hence, alternatives are offered and in some cases documentation as to intercomparability of the alternatives is also presented.

The subject matter is divided into four broad sections: sample collections, sample storage, sample preparation, and analytical methods. Each of these sections is further

subdivided into sample types, specific techniques, and typical types of problems encountered. For example, under sample storage, a section on sample containers discusses wall interaction, specifies materials, and compares the various metals, glasses, ceramics, and plastics available for containers. This example is typical of the kind of useful information which has been compiled in very readable form in this book. The radioisotopes considered in detail are three fission products, ^{90}Sr , ^{137}Cs , and ^{144}Ce , and two activation products, ^{60}Co and ^{65}Zn . Others, probably more important in marine contamination, are only briefly covered because of the lack of data and information in this context.

The main section of the book runs 77 pages, ending with recommendations and references. This is followed by ten supporting papers written by various members of the panel and other noted experts in the field. This section adds another 203 pages. These papers are extremely valuable and supply a good deal of fine detail for several of the particular radioanalytical and sampling schemes briefly covered in the main body of the book. In several papers, complete "cook book" procedures are given so that any worker can reproduce the system in identical form and presumably derive the same quality of data. Again, this section provides an excellent compilation of material, much of it already available but inaccessible in widely scattered journals and reports.

From the foregoing it is obvious that this volume will prove to be invaluable to investigators in this and related fields. Special mention

must be made of the very thorough referencing in both the main section and in most of the supporting papers, a very worthy asset in this book.

Herbert L. Volchok (PhD, Columbia University), a senior scientist in the Environmental Studies Division of the U.S. Atomic Energy Commission Health and Safety Laboratory in New York City, has worked primarily on the distribution and effects of the long-range long-term fallout from nuclear weapons tests with emphasis on the earth's surface and the oceans. Lately, this effort is partially shifting toward the environmental effects of more local contaminating events such as nuclear reactor and reprocessing plant effluents as well as local and global studies of stable trace metals.

Nuclear Techniques in Environmental Pollution

(Proceedings of a Symposium, Salzburg, 1970)

Editors IAEA

Publisher Unipub, Inc.

Pages 810

Price \$22.00

Reviewer Manchery P. Menon

This book is comprised of the proceedings of a 1970 symposium in Salzburg sponsored by the International Atomic Energy Agency. This volume, containing 54 technical papers presented by scientists from 33 countries, depicts the global concern for pollution problems and presents the nuclear techniques and methodology for the measurement and a better understanding of environmental pollutants.

The first paper, by Mott, gives an excellent review of the various nuclear techniques currently being pursued for pollution studies, with plenty of references. Many of the papers are largely concerned with the measurement of pollutants using such techniques as activation analysis, isotope-ratio measurement, x-ray fluorescence, activable tracer method, radiotracer technique, etc. Because of its high sensitivity, the activation analysis technique con-

tinues to be the method of choice, in many instances, to determine the trace elements in air pollutants, oil spillage, and aquatic environment. However, if the chemical state of the species in question is sought, some other technique such as electron spectroscopy, as recommended by Gordon, is to be employed. A novel technique perfected by the scientists of Brookhaven National Laboratory uses a dual-tracer system and isotope-ratio measurement for locating the source of air pollution with oxides of sulfur and for tracing plume emerging from power plant stalks. Instrument systems such as an electron capture detector to measure sulfur compounds and an auto exhaust monitor for the detection of carbon monoxide, hydrocarbons, and oxides of nitrogen in air have also been described.

There are only a few papers dealing with the transport, diffusion, and dispersion of atmospheric pollutants. The ⁸⁵Kr tracer grid system described by Nielson and Wogman to follow the atmospheric transport and diffusion process, is worthy of mention. Other studies included the transport and transformation of pesticides and other pollutants in air, water, and soil. Particularly excluded from the proceedings are papers on fallout studies involving naturally and artificially produced radionuclides. In the past, fallout studies have provided much information about the movement of airborne particulates.

The problem of mercury contamination which has generated considerable interest is discussed in detail in at least five papers. Application of radiotracer techniques for coastal pollution studies and sewage treatment problems is convincingly demonstrated in a number of papers.

Besides the content of the papers, the lively discussion included at the end of each paper in the book also exposes the reader to points of view other than that of the author on any given topic. This compilation is no doubt a useful reference book for those who are either interested or engaged in the environmental pollution studies.

Manchery P. Menon is professor of chemistry at Savannah State College. He came to Savannah in 1967 from Texas A & M University where he served in a dual capacity as

associate professor of chemistry and as the associate research chemist in the Activation Analysis Research Laboratory. He holds a PhD degree in inorganic and nuclear chemistry (University of Arkansas) and also has one year's post-doctoral training at the Massachusetts Institute of Technology. He also worked as summer faculty employee in Oak Ridge National Laboratory (1966) and in the IBM Thomas Watson Research Center (1969). He is the author and/or co-author of many publications in such areas as nuclear fission, activation analysis, and radiochemistry.

Dynamic Studies With Radioisotopes in Medicine

(Proceedings of a Symposium, Rotterdam, 1971)

Editors IAEA

Publisher Unipub, Inc.

Pages 901

Price \$24.00

Reviewer Harold L. Atkins

This volume consists of the proceedings of the symposium held in Rotterdam, August 31 to September 4, 1970 under the auspices of the IAEA. It is a worthy successor to *Dynamic Clinical Studies with Radioisotopes* (1964) published by the U.S. Atomic Energy Commission, Division of Technical Information. Many authors included in the earlier volume are also represented by contributions to this recent work.

The volume is divided into a number of sections which cover the following: theoretical aspects, techniques and instruments, thyroid function studies, renal function studies, hepatic and splenic function studies, mineral metabolism, regional blood flow, cardiac function, and pulmonary function. Each section is preceded by a general review paper which more or less summarizes past and present developments with some glimpses into the future. Of the 71 papers, 15 are in French, the rest in English.

It is interesting to note the rapid advances in techniques and instrumentation that have occurred since the 1964 publication. The use of the gamma camera with multichannel