application of liquid scintillation techniques in many fields. The section on nuclear instrumentation is much too brief; the functions of most nuclear instruments are not clearly described and little mention is made of the use of computers in nuclear instrumentation. In the opinion of the reveiwer, nuclear instrumentation merits a separate chapter in a text of this nature.

A topic that receives very little attention is environmental radioactivity. The sources of environmental radionuclides, their separation, and methods of investigation are important aspects of present-day radiochemistry. A separate chapter on radiation protection would be preferable to the small sections included in Chaps. 6, 7, and 14.

Nuclear and Radiochemistry is an excellent textbook for graduate or undergraduate nuclear chemistry courses despite the reservations noted above. In the reviewer's opinion, it remains the best text available. It is doubtful, however, if it can be used alone as a radiochemistry text, although the basic principles of nuclear science are well covered. For radiochemistry courses, supplementation with other sources is recommended. Nevertheless, the authors are to be congratulated on their excellent revision of a classic work. The book should also be recommended reading for any scientist requiring an overview of nuclear and radiochemistry. Making the book even more valuable are excellent bibliographies, a table of nuclides taken from *The Table of Isotopes* (7th ed., 1977), and the excellent and challenging problems at the end of most chapters. It is expected that this text will continue to draw enthusiastic responses from both undergraduate and graduate students in nuclear science and chemistry.

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Power Reactor Noise

Author	Joseph A. Thie
Publisher	American Nuclear Society, LaGrange Park, Illinois (1981)
Pages	208
Price	$38.00
Reviewer	Robert S. Wick

In the 18 years since the author published his U.S. Atomic Energy Commission monograph entitled *Reactor Noise*, there have been tremendous strides in this field both in the technology of measurement and in the area of phenomena identification. In a sense the use of power reactor noise as a diagnostic tool is perhaps coming of age. The author is quick to point out that the emphasis of this book is on the noise from operating power reactors as opposed to low power experiments of two decades ago. Hence, Dr. Thie is bringing the reader up to date with regard to the change in approach from a laboratory curiosity to potentially workable instruments for power plant operations. Thus, there is a minimum of overlap between his two monographs, although the first third of the book does review the fundamentals of noise theory and analysis.

The author has augmented his discussion of noise in pressurized water reactors (PWRs) and boiling water reactors (BWRs) with extensive references to the literature and to numerous national and international conferences. The most recent reference is dated 1980. All in all he has over 330 literature citations. Interestingly enough he has more literature citations for the two chapters on PWR and BWR reactors than he had for the entire first edition of the monograph.

After introductory chapters on statistical properties of noise, frequency-domain analysis, and time-domain analysis, he moves to the relationships between theoretical and experimental aspects of noise. The concept of neutron noise is reviewed next and then the remaining half of the book is devoted to reactor noise. Considerable emphasis is placed on the role structural elements of reactors play in noise generation. This is completely consistent with the number of operational problems that have arisen due to interaction between coolant flow and elastic structural members. The complications due to boiling are suitably addressed. Many practical problems and their resolutions are sited.

Considered as a whole, the book is an excellent up-to-date source of the state of the art for the practitioner and it is highly recommended as such. Of course it is concise, but the reader has the reference citations for greater detail. I would consider it as an excellent supplemental text to be used in conjunction with Robert Uhrig's text *Random Noise Techniques in Nuclear Reactor Systems*, Ronald Press, New York (1970).

In closing I would point out that the author presents in his introduction a very objective discussion of the reasons for and against the use of reactor noise tests. The points raised are still as germane as in the past, but the reasons for seem to have become somewhat more compelling than the reasons against since the publication of the first edition of this monograph.

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