fuel recovery process. Various alternative nuclear programs are considered in the light of assumptions of power demand and reactor characteristics. The sensitivity of the results to these assumptions was also studied. The article is quite interesting as a report of an individual study, but it is regrettable that the authors say very little to compare their work with that of others.

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About the Reviewer: Melvin Tobias is a member of the staff of the Reactor Division of the Oak Ridge National Laboratory with broad interests in nuclear reactors, especially the neutronics of fusion reactors. Dr. Tobias did his undergraduate work at the College of the City of New York and completed his graduate studies in chemical engineering at Minnesota.

Neutron Activation Analysis. By D. De Soete, R. Gijbels, and J. Hoste. Vol. 34, Chemical Analysis Series, Wiley Interscience (1972). 836 pp. $36.00.

Professor Hoste and his associates have assembled something far more comprehensive than just another book on activation analysis; this volume might more properly be called "Reference Book for Applied Nuclear Techniques." Treating in considerable detail such diverse but nevertheless important subjects as nuclear models, neutron spectra in reactors, radioactive growth and decay laws in many successive decays and branchings, and absolute counting and coincidence measurements, the authors have combined clarity of presentation with a profusion of references, figures, and tables. Lest the reader think that *Neutron Activation Analysis* is concerned solely with nuclear physics and theory, let me assure him that chemical science is well represented. For example, sections on concentration and separation prior to activation, dry ashing and wet combustion, and methods for interlaboratory comparison are followed by almost 80 pages that treat the general subject of activation analysis with postirradiation radiochemical separations.

Much practical information concerning standards and their preparation, containers and canning material, and selection of facilities and equipment complements the chemical and physical sections. The chapter on systematic errors is unusually detailed and informative; a section on dead-time corrections discusses this most important and often overlooked aspect of counting. Seven appendixes provide fintertip reference to such useful data as cross sections, gamma-ray energies, and attenuation coefficients. Two features of this book satisfy particular prejudices of mine: a complete list of symbols used is given at the beginning and a comprehensive index follows at the end. Thus the book begins and ends well and provides much useful information—symbols defined and well-indexed—in between.

A sin of omission and one of commission strike my eye. The former is the scarcity of information relating to Ge(Li) spectroscopy; while Ge(Li) detectors are discussed in several places, much of the spectrometry section is built around NaI. The sin of commission, I believe, was in including almost 180 pages of a bibliographic survey of neutron activation analysis, most of which is available, and much more up to date than the apparent 1968 cutoff date here, in the NBS bibliographical publications. I can understand the desire to include such documented examples of applied activation analysis, but to consume over 21% of the book for this purpose seems a bit excessive. However, the material is there and perhaps it will be more widely seen than if left to languish in government reports and obscure publications.

Neutron Activation Analysis fills an important need: the need for a comprehensive reference covering the physics, chemistry, and technology of applied nuclear analysis. It appears to be the definitive work that activation analysts have awaited.

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Shock Waves in Collisionless Plasmas. By Derek A. Tidman and Nicholas A. Krall. Wiley Interscience (1971). 175 p. $10.50.

Shock Waves in Collisionless Plasmas, a research monograph, is the residue from a series of lectures given at the University of Maryland in 1968. The authors, well known and respected members of the plasma physics community, recognized that there was a large and reasonably coherent body of knowledge on collision-free shocks but it was scattered among various journals of plasma physics, fluid dynamics, and space physics. They have gathered together that information and assembled it into as reasonable an order as can be expected for a complex subject that is still not well understood. The subject of collisionless shocks is important because the phenomenon occurs in space and because shocks are used to heat plasma to thermonuclear fusion temperature. In this text a collisionless shock is defined as any transition layer which propagates through a plasma in which the classical collision times are long compared to other times of interest, and which causes a change of state. The text is about the theoretical interpretation of such shock waves, and the authors employ the Vlasov-Maxwell system of equations or fluid descriptions derived from them. Classification and analysis of shock jump conditions and shock structures constitute the majority of the text. Because of magnetic fields and the multiple mechanisms by which a shock can change the state of a plasma, the array of explanations of shock structure is