

from the Pennsylvania State University. He is currently active in researching crystal defect interaction mechanisms and modeling irradiation effects in non-fuel metals and alloys.

AN-34 Experiments in Nuclear Science

Author Staff, ORTEC, Inc.
Publisher ORTEC, Inc., 203 Midland Road, Oak Ridge, Tennessee 37830 (1971)
Pages 129
Price \$10.00
Reviewer Wallace H. Fuller

Reviewing the publication, AN-34, *Experiments in Nuclear Science*, has been a pleasant experience. The manual is well written and organized in a fashion which facilitates both the comprehension and fulfillment of the experimental objectives. Sufficient references are also given to permit the student to obtain a more comprehensive treatment of the theory.

There is, however, no treatment of the phenomena of radioactive equilibria. Although half-life determination is given in this manual, the equilibria phenomena, which are a direct result of the half-lives of both parent and daughter nuclides, are not considered. Most lab manuals treat parent-daughter equilibria in some manner. For this reason, I believe at least a mention of this phenomena should be included if the inclusion of another experiment is not possible. Inexpensive minigenerators are available from the Educational Aids Department of the Union Carbide Corporation, Tuxedo, New York, which are specifically designed for the experimental observation of radioactive equilibria.

I feel sure that this publication will be useful for students as well as faculty and is an important addition to the radioisotope research and teaching programs.

Wallace H. Fuller (BS, MS, soil chemistry, Washington State University, 1938 and 1939; PhD, soil chemistry and soil microbiology, 1942)

was a research associate, Department of Agronomy, Iowa State University from 1940-45; biochemist and soil scientist, U. S. Department of Agriculture, Agricultural Research Service, 1945-48; associate professor and associate biochemist, University of Arizona, 1948-56; professor, biochemist and head of agricultural soils, 1956 to date. Professor Fuller's interests and areas of research have included many articles and papers on radioisotope fallout and instruction of advanced graduate course in radiotracer techniques. He has been a continuous researcher with radioisotopes since 1945.

Nuclear Data for Reactors

Conference Proceedings, Helsinki, 2nd International Conference on Nuclear Data for Reactors, June 15-19, 1970. Vols. 1 and 2

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Publishers Unipub, Inc. (1970)
Pages Vol. 1, 741
 Vol. 2, 958
Price Vol. 1, \$21.00
 Vol. 2, \$24.00
Reviewer David Okrent

These two volumes comprise the Proceedings, including over 100 papers and discussions, of the Second International Conference on Nuclear Data for Reactors held in Helsinki on June 15-19, 1970. The first conference held by the International Atomic Energy Agency (IAEA) on this subject occurred in Paris in 1966. The scope and emphasis of this conference are well delineated by the section titles of the volumes:

General Aspects of Needs and Uses for Nuclear Data

Cross Sections and Techniques for High-Precision Neutron Nuclear Data Measurements

Nuclear Data in the Thermal and Resonance Energy Region: $A > 220$

Nuclear Data in the Thermal and Resonance Energy Region: $A < 220$

Nuclear Data Above the Resonance Energy $A > 220$

Nuclear Data Above the Resonance Energy $A < 220$

Relationships of Microscopic and Integral Data

Evaluation Problems and Methods.

The bulk of the papers and all of the discussion are in English; however, a considerable number of papers are in Russian or French, except for brief English abstracts. The major emphasis is on data of interest to fast reactors.

This conference represents an important landmark in the nuclear data aspects of reactor physics, and the proceedings are in the excellent tradition of IAEA conferences, including major technical contributions from throughout the world of nuclear reactors. There is very good balance between review papers and new contributions.

The review papers in the opening session deal with the cross-section needs for fission reactors, fusion reactors, and astrophysics, and include a report on the current status of theoretical understanding of neutron cross sections. Each of the succeeding sessions also includes one or two review papers, and most of the contributed papers carefully presented new data in the context of existing information, so that the reader is provided with perspective.

Because of the current world-wide emphasis on fast reactor development, major attention in both data measurement and evaluation is given to fast neutron fission in ^{235}U and ^{239}Pu , capture in ^{239}Pu and ^{238}U , and inelastic scattering in ^{238}U , as well as the absolute value and energy dependence of ν and the resonance structure of the actinides.

Relatively good agreement on higher values of $\alpha = \sigma_{\text{capture}} / \sigma_{\text{fission}}$ for ^{239}Pu in the energy range 100 eV to 20 keV has now been obtained. On the other hand, despite extensive and careful work by several capable experimental groups, surprisingly large discrepancies continue to exist in the basic fission cross section for ^{235}U , relative to which most other fast fission cross sections are measured, and in the n, γ cross section for ^{238}U , which is very significant to criticality and reactivity prediction for large fast reactors. The difficulties of obtaining accurate absolute measurements, the interplay of factors involved in