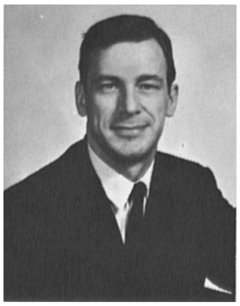
AUTHORS AND PAPERS

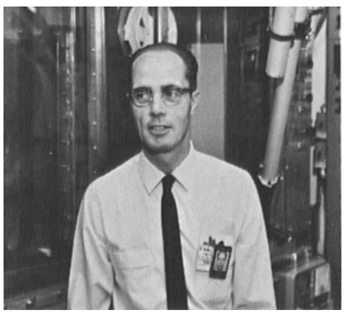
The highly condensed summaries of papers and technical notes (below) are intended to assist the busy reader in determining the order in which to read the technical material. Biographical comments are for human interest.



ISOTOPIC ANALYSIS OF UO_2 FUEL RODS

Uranium and plutonium isotopic distributions in UO_2 fuel rods irradiated to 22 000 MWd/MTU were measured experimentally. Data compared favorably (within ~5%) to theoretical predictions, although additional ^{238}U and ^{239}Pu cross-sectional information is believed necessary.

Joseph C. Stachew (MS, Carnegie-Mellon University, 1960) is presently a scientist in the PWR Project Nuclear-Thermal Performance Analysis Group at the Bettis Atomic Power Laboratory. He has been engaged in the design and analysis of Shippingport Cores 1 and 2 since 1960.

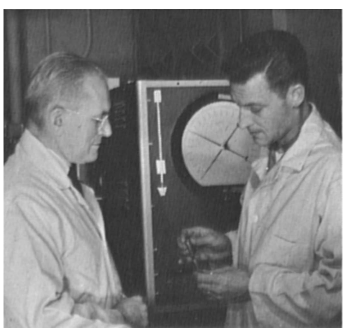


SEPARATION OF AMERICIUM FROM CURIUM

A detailed study of variables affecting the chemical separation of ^{243}Am from ^{244}Cm provides information for separation of multigram quantities on a routine basis.

G. A. Burney, a Senior Research Chemist at the Savannah River Laboratory, specializes in chemical separation of the actinide elements. He received his PhD in physical chemistry from the University of Michigan in 1953.

EBR-II FUEL CLADDING BURST TESTS



Type-304L stainless-steel cladding of EBR-II fuel elements irradiated to 10^{22} n/cm^2 (>0.1 MeV) has greater rupture strength and less ductility than unirradiated specimens. Rupture strength is related to fast-neutron exposure and irradiation temperature.

William F. Murphy (left), Associate Metallurgist, has studied radiation effects and conducted hot-cell examinations of fuels and structural materials since joining Argonne's Metallurgy Division in 1949. Harold E. Strohm, a senior engineering technician, has been involved with preparing irradiation experiments and hot-cell examinations for the past 12 years.

STEEL EMBRITTLEMENT

Neutron embrittlement of the steel pressure vessel for the SM-1A Reactor required modification of operating procedures and in-place annealing to avoid overstress. Future reactor designs could significantly reduce this problem by use of radiation insensitive steels, shielding, and the built-in capability for periodic annealing using reactor heat.

L. E. Steele (left) is Head of the Reactor Materials Branch of the US Naval Research Laboratory's Metallurgy Division, a post he has held for some time except for a brief sojurn as a metallurgical engineer with the Fuels and Materials Branch of the AEC's Division of Reactor Development and Technology. G. W. Knighton (right) is Chief of the Engineering Department's Operations Branch in the Army Nuclear Power Field Office. U. Potapovs, also associated with this office during the period in which the work described in their paper was done, is now in a metallurgist with NRL. Notwithstanding these moves, the authors have managed to collaborate successfully in their study of radiation-induced problems affecting the operational integrity of the several Army reactors.

NONDESTRUCTIVE ASSAY OF IRRADIATED FUEL

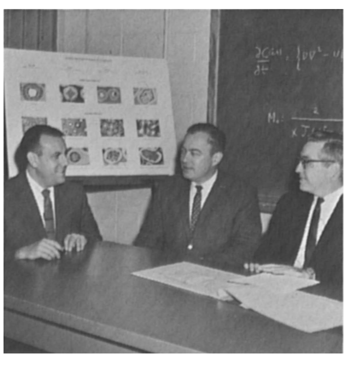
A comprehensive survey of nondestructive tests for safeguarding against diversion of fuel from peaceful uses to weapons is presented. Past, current, and proposed methods for determining burnup and Pu content of fuels are included.

Raymond R. Edwards (PhD, MIT, 1948) is a Lecturer in Chemistry at Carnegie-Mellon University. He formerly was Chairman of the Chemistry Department at the University of Arkansas before becoming an Assistant Director in the USAEC's Division of International Affairs where he was concerned with safeguards in the Atoms for Peace program.

ANALYSIS OF IMPURITIES IN ALPHA EMITTERS

Certain light elements that undergo nuclear reactions with alpha particles can be identified in alpha emitters, such as $^{238}PuO_2$, by analysis of the resulting gamma radiation. To establish a base for this type of analysis, reaction gamma spectra for 14 light elements were measured.

J. Malvyn McKibben (BS, Emory University) is a chemist in the Special Studies Group of the Separations Technology Section at the Savannah River Plant and former contributor to Nuclear Applications *(February 1966).*



MIXING OF TRACE GAS IN He

A theoretical model for measuring the dispersion of a radioactive gas in a sweep gas is in excellent agreement with experimental data. Although designed primarily for in-pile sweep-gas experiments, this model may be useful in understanding slug flow through reactor coolant piping.

The authors are members of the Reactor Chemistry Division of the Oak Ridge National Laboratory. R. M. Carroll (right) is Group Leader for fission product behavior studies. O. Sisman (center), at Oak Ridge since 1944, is Chief of the Reactor Materials Section. R. B. Perez was an Associate Professor at the University of Florida before joining ORNL this year.