

MANSON BENEDICT  
 DEAN BROWN  
 E. RICHARD COHEN  
 E. C. CREUTZ  
 FRANK G. DAWSON  
 O. E. DWYER  
 PAUL GAST  
 D. H. GURINSKY  
 A. F. HENRY  
 A. A. JOHNSON  
 C. H. MILLAR  
 L. W. NORDHEIM  
 HUGH C. PAXTON  
 FRED W. THALGOTT

ANS Officers

JOHN W. LANDIS  
 President  
 JAMES R. LILIENTHAL  
 Vice President/President Elect  
 J. ERNEST WILKINS, JR.  
 Treasurer  
 RAYMOND D. MAXSON  
 Assistant Treasurer  
 OCTAVE J. DU TEMPLE  
 Executive Secretary

ANS Publications Staff

NORMAN H. JACOBSON  
 Publications Manager  
 RUTH FARMAKES  
 Assistant Staff Editor  
 KATHRYN L. FROEHLICH  
 Copy Editor  
 SIEGFRIED H. KRAPP  
 Production Manager  
 LINDA A. DOLBY  
 Production Assistant

Composition

BELJAN, ANN ARBOR, MICH.

NUCLEAR SCIENCE AND ENGINEERING is published monthly by the American Nuclear Society, Incorporated, with executive and business offices at 244 East Ogden Avenue, Hinsdale, Illinois 60521—telephone 312/325-1991. Subscription rate is \$90/3 volumes, calendar year; \$35/single volume; single copy price is \$10 (special issues slightly higher); address subscription orders to the American Nuclear Society (back issues of Volumes 1-17 are available from Academic Press, 111 Fifth Avenue, New York, N.Y.). Second-class postage is paid at Hinsdale, Illinois and at additional mailing offices. NUCLEAR SCIENCE AND ENGINEERING is printed in Danville, Illinois. Copyright © 1972 by the American Nuclear Society, Inc. Inquiries about the distribution and delivery of NUCLEAR SCIENCE AND ENGINEERING and requests for changes of address should be directed to the publisher, the American Nuclear Society, 244 East Ogden Avenue, Hinsdale, Illinois 60521. Allow 6 weeks for a change to become effective.

Contents

TECHNICAL PAPERS

Gamma-Ray Albedo Calculations Using Moments Method . . . . . *C. V. Smith and N. E. Scofield* 1

A Comparison of Calculated and Measured Yields of Neutron-Energy-Dependent Capture Gamma Rays from Uranium-238 . . . . . *R. S. Booth, J. E. White, S. K. Pemny, and K. J. Yost* 8

Fast Neutron Total and Scattering Cross Sections of Plutonium-240. . . . . *A. B. Smith, P. Lambropoulos, and J. F. Whalen* 19

The Effect of Wide Scattering Resonances on Neutron Multigroup Cross Sections . . . . . *Weston M. Stacey, Jr.* 29

Determination of Neutron Multiplication Factors as a Function of Temperature with the High Temperature Lattice Test Reactor . . . . . *C. R. Richey and T. J. Oakes* 40

Benchmark Gas Core Critical Experiment . . . . . *J. F. Kunze, J. H. Lofthouse, C. G. Cooper, and R. E. Hyland* 59

Improvements to Neutron Slowing Down Theory for Fast Reactors *Floyd E. Dunn and Martin Becker* 66

The Formulation and Application of Analytic Representations of Fast Reactor Flux and Importance Spectra . . . . . *Floyd E. Dunn and Martin Becker* 83

The Concept of Multiple-Input Zero Power Describing Functions in Nuclear Reactors. . . . . *A. Z. Akcasu and C. M. Bost, Jr.* 104

Anisotropic Diffusion Coefficient in Generalized XY Geometry: Theory and Application to Diffusion Codes . . . . . *M. Michelini* 116

Safety Effects of Light Water Infiltration in the Argonne Research Reactor (CP-5) . . . . . *Charles N. Kelber* 127

Physical Properties of the "Once Through Then Out" Pebble-Bed Reactor . . . . . *U. Hansen, R. Schulten, and E. Teuchert* 132

The Hot Channel Factor as Determined by the Permissible Number of Hot Channels in the Core. . . *P. L. Arnsberger and M. Mazumdar* 140

TECHNICAL NOTES

A Dead Time Correction for Gamma-Ray Spectroscopy . . . . . *W. Filippone and F. J. Munno* 150

The Thermal-Neutron Capture Cross Section and Resonance Capture Integral of Krypton-80 . . . . . *James G. Bradley and Walter H. Johnson* 151

Steady-State Neutron Spectra in Ice in the Temperature Range 268 to 4°K. . . . . *G. S. Gangwani, S. P. Tewari, and L. S. Kothari* 153

Two-Group Neutron Transport Theory with Anisotropic Scattering. . . . . *R. J. Reith, Jr. and C. E. Siewert* 156

COMPUTER CODE ABSTRACTS . . . . . 163

CORRIGENDA. . . . . 167