International Atomic Energy Agency

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INDC INTERNATIONAL NUCLEAR DATA COMMITTEE

Table of Content Translations

of

Soviet Reports received by the

INDC Secretariat

April 1980

IAEA NUCLEAR DATA SECTION, WAGRAMERSTRASSE 5, A-1400 VIENNA

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Foreword

The INDC Secretariat receives a number of Soviet reports in Russian as part of the INDC document distribution system. Because of their large number and size most of them cannot be translated by the IAEA. The "Nuclear Physics Research in the USSR - Collected Abstracts" report series and occasional reports of interest to the nuclear data community are translated by the IAEA on a regular basis, and are normally given a "U" distribution.

The "Table of Content Translations" contain the translation of the table of contents, and abstracts when available, of those Soviet reports which the IAEA does not translate. The originals of these reports are normally available in limited quantities only and are given an INDC "G" distribution.

This issue contains the table of content translation of the following reports:

- Nuclear Constants, Number 2(33)
  Original distributed as INDC(CCP)-139/G

- Nuclear Constants, Number 3(34)
  Original distributed as INDC(CCP)-140/G

- Nuclear Constants, Number 4(35)
  Original distributed as INDC(CCP)-145/G

NUCLEAR CONSTANTS, Number 2(33)

INDC(CCP)-139/G

ON THE THEORY OF NEUTRON-PHYSICS EXPERIMENTS

V.N. Dushin

Questions on obtaining nuclear constant values from experimental data are considered. The method is based on considering the problem of determining the exact nuclear constant values from differential experiments as inverse radiation transport problem is suggested. In this case there is no necessity to take into account corrections which arise in real experimental conditions. The possibility appears to estimate directly the covariance matrix - the significant part of the system of constants. Using the obtained correlational properties of the nuclear constants it now becomes possible to plan a number of differential experiments with the object to increase the accuracy of nuclear constants. To solve the inverse radiation transport problem, which is often incorrectly posed, stochastical quasigradient and statistical regularization methods are suggested. As an example, the determination of nuclear constant values from experimental data are given.

CORRECTION FOR A FINITE SAMPLE DIMENSION IN THE DOUBLE DIFFERENTIONAL SLOW NEUTRON SCATTERING CROSS-SECTION MEASUREMENTS

Yu.V. Lisitchkin, A.G. Dovbenko, B.A. Efimenko, A.G. Novikov, L.D. Smirenkina, S.I. Tikhonova

The procedure of experimental results using the three computer programs: FISC, SCATL and DDS is described. The results of the procedure mentioned as applied to the double differential cross-section of water measured by the DIN-1M spectrometer are given.

EFFECT OF ISOSPIN IMPURITY IN (p,n), (p,p') AND (n,n') REACTIONS

Ya. Tertychnyi, E.L. Yadrovskij

In the framework of the shell-model, the analysis of the isospin impurity was performed for the reactions (p,n), (p,p'), (n,n'). The direct and compound processes were considered. The isospin mixing parameters of the first IAR, μ, were found to be remarkably less than the experimental values, obtained at higher excitation energies. This difference may be due to a different isospin mixing mechanism for the high and low energies and to an inaccurate extraction of these values from the experiment.

ON THE INFORMATIONAL CONTENT OF THE EXPERIMENTAL CURVE WITH ERRORS

V.N. Vinogradov, E.V. Gai, N.S. Rabotnov

A set of interpolation points is considered as a set of general parameters for experimental functions approximation, with the whole number being equal to that of the parameters of the theoretical model. This makes it possible to introduce a common scale and a zero point for all coordinates in the space of parameters. Also it is possible with the use of the entropy of the joint probability distributions for interpolated points to calculate the amount of analytical information in the experimental data. A numerical example is considered.

ON SOME FEATURES OF THE PROMPT FISSION NEUTRON SPECTRUM

G.M. Akhmedov, V.S. Stavinskij

Expressions for the prompt fission neutron spectra in the centre of mass system and laboratory system within the framework of the Weisskopf theory have been derived. The cascade evaporation of neutrons and the initial excitation energy distribution of fragments is taken into account. The results are compared with the experimental data.

SHAPE DETERMINATION OF THE NATURAL LINE IN THE SPECTRA OF QUASI-ELASTIC SLOW NEUTRON SCATTERING IN WATER

S.M. Iskenderov, A.A. Van'kov, A.G. Novikov

The efficiency of the Bayesian approach to derive the natural line form from the slow neutron quasielastic scattering spectra is demonstrated. The influence of the a priori information on the character of the solution is analysed.

CALCULATION CHARACTERISTICS OF THE (n,p) REACTION EXCITATION FUNCTIONS

Yu.N. Trofimov

An agreement of relationships, used by various authors for the calculation of reaction cross-sections is demonstrated in the framework of the evaporation approximation of the statistical theory. An empirical expression for the calculation of the neutron energy for the excitation function maximum of the (n,p) reaction is presented. Experimental and calculational data for 26 nuclides are tabulated.

THE (n,α)-REACTION CROSS-SECTIONS IN NEUTRON ENERGY RANGE FROM THRESHOLD UP TO 20 MEV

V.M. Bychkov, V.N. Manokhin, A.B. Pashchenko, V.I. Pliaskin

The (n,α) reaction cross-section compilation for nuclei with $Z \geqslant 20$ in the neutron energy range from threshold up to 20 MeV was made. The compilation results are presented on graphs. Recommended curves of excitation functions obtained as a result of analysis of experimental data and theoretical calculations are given for some nuclei. The numerical information on measurement results in the 14-15 MeV neutron energy range, and the evaluated value of (n,α)-reaction cross-section at E_n = 14,5 MeV are tabulated. Experimental data published up to 1977 were taken into account.

This article is to be translated in full by the IAEA, and will be published together with Parts 1, 2 and 4 of this article in INDC(CCP)-146/L.

THE LEVEL DENSITY PARAMETER RESULTING FROM THE ANALYSIS OF NEUTRON ENERGY DISTRIBUTIONS IN THE ^{181}Ta(p,n) REACTION

M.I. Svirin

Analysis of neutron emission spectra from the ^{181}Ta(p,n) reaction at incident proton energies of 6-23 MeV has been done within the framework of the statistical theory and preequilibrium model. The level density parameter behaviour is obtained in a wide excitation energy range.

NIOBIUM DIFFERENTIAL CROSS-SECTIONS OF INELASTIC NEUTRON SCATTERING AT INCIDENT ENERGIES 5,23; 6,22 AND 7,23 MEV

G.N. Lovchikova, G.V. Kotel'nikova, O.A. Salnikov, S.P. Simakov, A.M. Trufanov, N.I. Fetisov

The differential cross-sections of inelastic neutron scattering for niobium have been measured for incident neutron energies 5,23; 6,22 and 7,23 MeV. The measurements were performed by time-of-flight method using a tritium gas target as the neutron source. The cross-sections are tabulated.

ACCOUNT OF "TRANSPORT EFFECTS" IN DIFFUSION CALCULATIONS VIA TRANSPORT CROSS-SECTION CORRECTIONS

V.N. Gurin, A.M. Poplavko

A simple method is suggested for taking into account of "transport effect" in diffusion calculations via transport cross-section. The method is suitable for use in many types of one-dimensional calculations. Calculations are made for uranium-water homogeneous system with high enrichment uranium and show good agreement with exact calculations.

CORRELATION RELATIONS FOR CRITICAL PARAMETERS OF HOMOGENEOUS URANIUM-WATER SYSTEMS

V.N. Gurin, A.M. Poplavko

Correlation relations for the determination of material buckling, extrapolation distance, water reflector savings, bare reactor radius and water reflector reactor radius are obtained. These relations are recommended for homogeneous URANIUM-system of any enrichment and concentration.

BIBLIOGRAPHIC CINDA INDEX OF WORKS DESCRIBED IN "NUCLEAR CONSTANTS" 2(33)(1979)

Element S	Element A	Quantity	Laboratory	Work-type	Energy, eV min	Energy, eV max	Page	Comments
MG	024	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
AL	027	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
SI	028	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
P	031	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
S	032	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
CA	040	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
CA	042	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
CA	044	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
SC	045	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
TI	046	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
TI	048	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
TI	048	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+,SIG(NEUT-E),TBL
TI	050	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
V	051	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
V	051	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
CR	050	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
CR	052	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
CR	052	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
CR	053	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
CR	054	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
MN	055	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
MN	055	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
FE	054	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
FE	056	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
FE	056	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
FE	057	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
FE	058	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
CØ	059	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL
NI	058	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
NI	060	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
NI	060	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
NI	062	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
NI	064	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
CV	063	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
CU	065	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
ZN	066	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
ZN	068	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
ZN	070	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
GA	069	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
GA	069	NP	RI	EXPT	+7		47	TRØFIMØV.FN EXCIT,SIG,TBL
GA	071	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL
GA	071	NA	FEI	EVAL	1.4+7	1.5+ 7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
GE	070	NP	RI	EXPT		+ 7	47	TRØFIMØV.FNEXCIT,SIG,TBL,GRAPH

Element S	A	Quantity	Laboratory	Work-type	Energy, eV min	max	Page	Comments
GE	072	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
GE	074	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
AS	075	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
AS	075	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
SE	078	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
SE	080	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
BR	079	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
BR	081	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
RB	085	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
RB	087	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
SR	086	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
Y	089	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
ZR	09	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
ZR	092	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
ZR	094	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
ZR	096	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
NB	093	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
NB		DIN	FEI	EXPT	5.2+6	7.2+6	71	LØVCHIKØVA+.TØF,DIFFSIG,TBL
MØ	092	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
MØ	095	NP	RI	EXPT	+7		47	TRØFIMØV.FNEXCIT,SIG,TBL
MØ	098	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
MØ	100	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
RU	102	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
RU	104	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
RH	103	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
PD	106	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
PD	108	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
AG	109	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
CD	106	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
CD	112	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
CD	114	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
CD	116	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
IN	115	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
SN	118	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
TE	099	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
TE	124	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
TE	126	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
TE	128	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
TE	130	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
CS	139	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
BA	138	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
LA	139	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
CE	140	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
CE	142	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
ND	142	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
ND	144	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
ND	146	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
ND	148	NA	FEI	EVAL	1.4+7	1.5+7	51	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH

Element S	Element A	Quantity	Laboratory	Work-type	Energy, eV min	Energy, eV max	Page	Comments
EU	153	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
GD	158	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
GD	160	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
TB	159	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
DY	162	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
DY	164	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
HØ	165	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
ER	168	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
ER	170	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
YB	174	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
LU	176	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
HF	178	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
HF	180	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
TA	181	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
W	184	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
W	186	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
RE	187	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
ØS	190	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
IR	191	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
PT	194	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
PT	196	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
PT	198	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
AU	197	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
HG	200	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
HG	202	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
TL	203	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
TL	205	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
PB	206	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
PB	207	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
PB	208	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
PB	209	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
BI	209	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
TH	230	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH
U	238	NA	FEI	EVAL	1.4+7	1.5+7	5I	BYCHKØV+.SIG(NEUT-E),TBL,GRAPH

NUCLEAR CONSTANTS, Number 3(34)

INDC(CCP)-140/G

THE σ_f ^{235}U-FISSION CROSS-SECTION EVALUATION IN THE ENERGY REGION FROM 0,1 KEV TO 20 MEV

V.A. Konshin, V.F. Zharkov, E.Sh. Sukhovitskij

A method for determining evaluated data errors, taking into account the correlation between experimental errors is suggested. The total experimental errors are split into partial ones. The relationship of the present method with the least squares method is shown. The experimental correlation coefficient matrices for each partial error, as well as for different energy intervals are given. The method is used for the σ_f ^{235}U evaluation taking into consideration 28 works. A comparison of the evaluated data obtained with the ENDF/B-V data shows their agreement within 1 to 3 %.

This article is being translated in full by the IAEA.

FISSION AND RADIATIVE CAPTURE GROUP NEUTRON CROSS SECTIONS FOR TRANSACTINIDES

A.I. Voropaev, A.A. Van'kov, V.V. Voziakov, A.C. Krivtsov, V.N. Manokhin, A.G. Tsykunov

The comparison of evaluated radiative capture and fission cross-sections for the ^{236}U, ^{237}Np, ^{238}Pu, ^{241}Am, ^{243}Am, ^{242}Cm, ^{244}Cm isotopes is made, recommendations on choice of group-averaged cross-sections for fast reactors are given. For many isotopes only single evaluations exist, so for 9 other isotopes the group cross-sections obtained from HEDL data (evaluations for ENDF/B-V Library) are given, and the group cross-sections calculated from the ENDL-76 Library are listed for 32 isotopes. In recommending the cross-sections, the criteria used were: consistency with experimental data (if available), documentation and completeness of calculations on the basis of theoretical models. The reliability of evaluations is discussed. Effort is made to estimate the uncertainties of one-group cross-sections averaged over a typical fast reactor spectrum. Conclusions were drawn after studying the experimental and calculational status and the disagreement between different evaluations of transactinide cross-sections. The integral experiments available for the adjustment of transactinide cross-sections are briefly discussed.

This article is being translated in full by the IAEA.

DIFFERENTIAL CROSS-SECTIONS OF INELASTICALLY SCATTERED NEUTRONS WITH AN ENERGY OF 5,34 ± 0,05 MEV FROM ^{113}In

G.N. Lovchikova, O.A. Sal'nikov, S.P. Simakov, A.M. Trufanov

The differential cross-sections of inelastic neutron scattering by ^{113}In have been measured for an incident neutron energy 5,34 ± 0,05 MeV. The measurements were performed by time-of-flight method using a tritium gas target as the neutron source. The cross-sections are listed.

COLLAPSING OF BROAD GROUP CONSTANTS FOR SHIELDING CALCULATIONS

V.F. Khokhlov, I.N. Sheino, V.D. Tkatchev

An approximate method of taking space and angular dependence of a neutron flux into account is suggested for the generation of broad group cross-sections used in a shielding problem. Illustrative calculations for typical compositions show a satisfactory agreement between results obtained by using the suggested method and that of 21-group calculations.

CORRECTIONS TO THE DETAILED ENERGY DEPENDENCE OF THE TOTAL NEUTRON CROSS-SECTION

V.N. Vinogradov, E.V. Gai, N.S. Rabotnov, V.V. Filippov

A method of taking into account the energy resolution based on rational approximation is applied to correct the detailed energy dependence of the total neutron cross-section with chromium nuclei taken as an example. The influence of the resolution on the calculated values of the transition functions for chromium samples of various thicknesses is discussed.

THE SPECTRA OF UNSCATTERED NEUTRONS AND THE TOTAL NEUTRON CROSS-SECTION PROBABILITY DISTRIBUTION

A.N. Glukhovets, G.A. Miakishev, M.Z. Tarasko, V.V. Filippov

The results of neutron transmission function T(t) measurements under "good geometry" conditions for Fe, Ni and Ti are discussed. Values of T(t) obtained by neutron time-of-flight on the LUE-25 linac and by using continuous neutron beam transmission through hydrogen are compared with results measured using neutrons from the T(p,n) reaction. Examples of total neutron cross-section probability distributions P(σ) obtained from measured transmission T(t) are presented.

NUCLEAR CONSTANTS FOR SOLVING HIGH ENERGY RADIATION PHYSICS PROBLEMS

B.S. Sytchev

The generation of a system of constants with consideration to experimental data published in recent years, for high energy radiation physics is discussed. Information on double differential distributions is given.

THE NUCLEUS-NUCLEUS INTERACTION CONSTANTS AT ENERGIES OF 0.1 - 1.0 GEV/NUCLEON

V.E. Dudkin, I.I. Pianov, V.D. Stepnov

A method to calculate the differential and average distributions of secondary particles in nucleus-nucleus interactions, using a cascade model, is presented.

Bibliographic CINDA index of works described in "Nuclear Constants 3 (34)" (1979)

Element		Quan-tity	Labo-rato-ry	Work-type	Energy (eV)		Page	COMMENTS
S	A				min	max		
IN	113	DIN	FEI	EXPT		5,3+6		LØVCHIKØVA+.TØF,SIG(NEUT-E),TBL
TH	231	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
TH	231	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
U	235	NF	TMO	EVAL	1,0+2	2,0+ 7		KØN'SHIN+.SIG(NEUT-E),TBL.CFD OTHERS
U	236	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
U	236	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
NP	237	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
NP	237	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
NP	237	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
PU	238	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
PU	238	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
PU	238	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
PU	239	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
PU	240	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
PU	241	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
PU	242	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
PU	243	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
AM	241	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
AM	241	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
AM	243	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CM	241	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CM	242	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CM	244	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CM	245	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CM	245	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CM	246	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CM	246	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CM	247	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CM	247	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CM	248	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CF	249	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CF	249	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CF	250	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CF	250	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CF	251	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CF	251	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CF	252	NF	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL
CF	252	NG	FEI	EVAL		+7		VØRØPAEV+.TØF,SIG(NEUT-E),TBL

NUCLEAR CONSTANTS, Number 4(35)

INDC(CCP)-145/G

ROLE OF THE COMPOUND NUCLEUS MECHANISM IN THE LOW ENERGY (d,p) REACTION

V.E. Kolessov, N.N. Titarenko

The dependence of angular distribution and (d,p) reaction spectroscopic factors in the distorted wave methods and in statistical theory were investigated. It was shown that spectroscopic factors strongly depend on model parameters for deuteron energy less than 10 MeV.

MEASUREMENT OF THE Pu-240 FISSION CROSS-SECTION IN THE NEAR THRESHOLD REGION

F.E. Fomushkin, G.F. Novosselov, Yu.I. Vinodragov, V.V. Gavrilov

The ^{240}Pu fission cross-section in the energy region $0{,}01 \leqslant E_n \leqslant 4$ MeV were measured with nuclear explosion neutrons. The fragment detectors were of dielectrical types. The electromechanical system measured the transit time scanning. Measurement results are shown for 17 neutron energy intervals.

RELATIVE YIELDS OF DELAYED NEUTRONS AS NUCLEAR-PHYSICS CONSTANTS

B.P. Maksyutenko, A.A. Shimanskij, Yu.F. Balakshev, S.F. Gritskevitch

A new method of analysis and estimation of the relative yield of delayed neutrons based on the physical relations between fission process and delayed neutrons is considered. A good correlation is observed for uranium isotopes and large differences are shown for plutonium isotopes.

A (n,2n) REACTION CROSS-SECTION COMPILATION FOR NUCLEI WITH $Z \geqslant 20$ IN THE NEUTRON ENERGY RANGE FROM THRESHOLD UP TO 20 MEV

V.M. Bychkov, V.N. Manokhin, A.B. Paschenko, V.I. Pliaskin

The compilation results are presented on graphs. Recommended curves of excitation functions obtained as a result of analysis of experimental data and theoretical calculations are given for some nuclei. The numerical information on measurement results into 14-15 MeV neutron energy range and the evaluated value of (n,2n) reaction cross-section at $E_n = 14{,}5$ MeV are given. Experimental data published up to 1977 were taken into account.

This article is to be translated in full by the IAEA, and will be published together with Parts 1, 2 and 3 of this article in INDC(CCP)-146/L.

THE TRANSMISSION FUNCTIONS OF U-235 FOR THE TOTAL AND FISSION CROSS-SECTIONS HAVE BEEN MEASURED ON THE TOP SPECTROMETER IN THE NEUTRON ENERGY RANGE 0.002 - 20 KEV

A.A. Van'kov, Yu.V. Grogor'ev, V.F. Ukrantsev, T. Bakalov, G. Il'tchev, S. Toshkov, Tchan Chan Mai

The sub-group parameters of total and fission cross-sections and also self-shielding factors of these cross-sections were obtained.

SIMULATION OF EXPERIMENTAL MEASUREMENTS OF EFFECTIVE RESONANCE ^{238}U INTEGRAL BY MONTE-CARLO METHOD

V.V. Korobeinikov, A.G. Sboev, V.V. Tebin

Hellstrand simulation of the effective ^{238}U resonance integral by Monte-Carlo method is given. It is shown, that the used neutron cross-sections give good agreement with results of integral experiments. The present work gives calculation results comparing ^{238}U resonance integrals at different approximations in cross-section representations.

KERMA FACTORS FOR NEUTRON INTERACTIONS IN BERYLLIUM OXIDE

I.M. Bondarenko

Heat generation by neutrons in beryllium oxide is calculated in the present work. Kerma factors (kerma = kinetic energy released in materials) were calculated for neutron energies between 1 eV and 20 MeV. No major simplifying assumptions are introduced and the accuracy of the calculated kerma factors depends only on availability and accuracy of the basic nuclear data. The ENDF/B-IV data and recent experimental information are used for the calculation of kerma factors. Plots of these kerma factors are presented in units of (eV.b/atom) as a function of neutron energy.

ON THE ROLE OF THE HEAVY ATOM BINDING ENERGY IN A LATTICE FOR THE DETERMINATION OF THE ATOMIC DISPLACEMENT CROSS-SECTION AND THE REMOVAL CROSS-SECTION IN NEUTRON RESONANCE SCATTERING

A.A. Van'kov

The process of resonance neutron scattering by heavy nuclei has a compound-state life-time comparable with an atomic displacement time in a lattice. In neutron kinetics this effect leads to additional energy loss equivalent to the atom-lattice binding energy, contrary to the instant collision picture. In some cases the effect has to be taken into account in determination of atomic displacement cross-section and neutron removal cross-section.

Bibliographic CINDA index of works described in "Nuclear Constants 4(35)" (1979)

Element S	Element A	Quantity	Laboratory	Compiler	Work-type	Energy, eV min	Energy, eV max	Reference	Date	Comments
RB	093	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
I	137	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
I	138	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
U	233	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
U	235	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
U	235	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
U	235	TØT	FEI	Ø	E	2.0+0	2.0+4	YK 35	79	VAN'KØV+.TØF,TBL
U	235	NF	FEI	Ø	E	2.0+0	2.0+4	YK 35	79	VAN'KØV+.TØF,TBL
U	238	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
U	238	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
PU	240	NF	CCP	Ø	E	2.0+3	2.0+5	YK 35	79	FØMUSHKIN+.SIG(E),TBL
PU	239	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
BR	088	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
BR	089	NUD	FEI	Ø	E	6		YK 35	79	MAKSJUTENKØ+.YLD DELAYD NEUTS
MANY		N2N	FEI	Ø	E	1.4+7	1.5+7	YK 35	79	BYCHKØV+.SIG(NEUT-E),TBL