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JAPANESE LIST OF REQUESTS FOR NEUTRON NUCLEAR DATA MEASUREMENTS

January 1975

Compiled by
WRENDA Working Group of
Japanese Nuclear Data Committee

日本原子力研究所
Japan Atomic Energy Research Institute

Japanese List of Requests for Neutron Nuclear Data Measurements

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Abstract: Requests for neutron nuclear data measurements are presented. These are compiled by a WRENDA Working Group of Japanese Nuclear Data Committee and submitted to 75WRENDA. This activity is a part of the international cooperation with CCDN, NEANDC and INDC.

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中性子核データの測定に対する日本の要望リスト

日本原子力研究所シグマ研究委員会

WRENDAグループ*)編

（1975年1月11日受理）

中性子核データの測定に対する要望をシグマ研究委員会のWRENDAワーキンググループが編集し，75WRENDAに提出した。この作業はCCDN，NEANDC，INDCとの国際協力の一つとして行った。

1975年1月

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1. Introduction

Since 1968, Japanese Nuclear Data Committee (JNDC) has compiled request lists for neutron nuclear data measurements[1~3]. In June 1974, the Committee set up a standing Working Group for screening the domestic requests. The Working Group started with an examination of the old Japanese requests which are compiled in 74WRENDA.[4]

This report presents the Japanese List of Requests for Neutron Nuclear Data Measurements compiled by the Working Group at the end of 1974, and the list was submitted to the 75WRENDA[5] through CCDN. The list is composed of the remaining requests from those registered in the 74WRENDA[4] and the requests newly submitted to the 75WRENDA[5]. The former requests were left or modified through screening all the Japanese requests presented in the 74WRENDA. In the present list, these are attached with their 74WRENDA registration numbers in parentheses and status comments given in the 74WRENDA. The latter requests are mainly those for neutron capture cross section of fission product nuclides and those for the data of transuranium nuclides.

As for the fission product nuclear data (FPND), the present status of the experimental data was surveyed by the members of FPND Working Group of JNDC. Through their preliminary evaluation work[6], they set the criteria for the requests as; (1) the most important quantity for the FPND is the neutron capture cross section in the energy region of 100 eV to 400 keV, (2) nuclides with the highest priority are those with fractional contribution of 3% or more to the total neutron capture by the fission products, and (3) nuclides with no experimental data or with large discrepancies between the data should be remarked.

The requests for the data of the transuranium nuclides are characteristic of the present list of requests. These are for the estimation of the transuranium nuclei in the spent fuel. Though we dropped them from the present list, the requests for the measurements of the reactions H(α,n), B(α,n), C(α,n), N(α,n), O(α,n) and F(α,n) were submitted to the WRENDA Working Group. These data will be used for estimation of the neutron production rate from the compounds blended with the transuranium nuclei.

2. Request List for Neutron Nuclear Data Measurements

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
1 (692038)	Na	N,GAMMA	1.0+2	5.0+4	10.0	1	JAE	S. Katsuragi. Resonance parameters needed. For fast reactors. Discrepancies in resonance parameters exist.

Status:
BUC Plostinaru+, SCF 25 387(1973), data 0.92 to 4 MeV.
AUA Clayton, AUJ 23 823(1970), fits total sigma near 2.85 keV with capture width of 0.36 eV.
RPI Yamamuro+, NSE 41 445(1970), finds capture width is 0.47 eV at 2.85 keV.
RPI Hockenbury+, PR 178 1746(1969), finds capture width of 0.45 eV at 2.85 keV.
GA Friesenhan+, 68 Washington paper 5(1968), finds capture width of 0.34 eV at 2.85 keV.
COL Rahn+, USNDC-3 66(1972), work in progress.
USA USNDC, capture width discrepancy remains.

2 (682007)	^{27}Al	N,ALPHA	8.0+6	1.2+7	4.0	1	KYU	Y. Kanda. For neutron yield monitor. Data available 7%.
3 (712006)	^{40}Ar	N,GAMMA		1.0+7	< 20.0	2	NAIG	M. Kawai. For reactor hazard calculation.
4 (712015)	Cr	ACTIVATION		1.0+7	< 20.0	2	NAIG	M. Kawai. For fuel cask design and control rod design.

Status:
RPI Stieglitz+, NP/A 163 592(1971), high resolution data from separated isotopes up to 200 keV.
KFK Beer+, EANDC(E)-157(1973), measurements in progress on separated isotopes.
CAD Le Rigoleur, EANDC(E)-150(1970), measurement in progress from 10 to 200 keV.
HAR Coates, measurement planned.

5 (712018)	Mn	ACTIVATION		1.0+7	< 20.0	2	NAIG	M. Kawai. For fuel cask design and control rod design.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	ENERGY(EV) MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
								Status: ORL Macklin+, USNDC-3 148(1972), work in progress 3 to 500 keV. HAR Coates, measurement planned.
6 (692102)	Fe	N,GAMMA	1.0+3	2.0+5	10.0	1	JAE	S. Katsuragi. For fast reactors. Discrepancies exist among experimental data.
								Status: HAR Moxon, evaluation indicates 20 percent uncertainty below 100 keV. CAD Le Rigoleur, EANDC(E)-150(1972), measurements in progress 10 to 200 keV. HAR Coates, measurement planned.
7 (682012)	^{56}Fe	N,PROTON	8.0+6	1.2+7	4.0	1	KYU	Y. Kanda For neutron yield monitor. Data available 5% or 7%.
								Status: GEL Euratom neutron dosimetry group, current accuracy is 8%.
8 (712028)	^{59}Co	ACTIVATION		1.0+7	< 20.0	2	NAIG	M. Kawai. For fuel cask design and control rod design.
								Status: AUW Murty+, JPJ 35 8(1973), value at 24 keV. ORL Macklin+, USNDC-3 148(1972), work in progress.
9 (692129)	Ni	N,GAMMA	1.0+3	2.0+5	10.0	1	JAE	S. Katsuragi. For fast reactors. Data are not sufficient above 10 keV.
								Status: AUA Broomhall+, AAEC/PR 35(1971), work in progress 10 to 50 keV. HAR Axmann+, AERE-PR/NP 18(1972), work in progress up to 100 keV.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
		CAD Le Rigoleur, EANDC(E)-150(1972), work in progress up to 200 keV. KFK Beer+, EANDC(E)-157(1973), work in progress on separated isotopes. HAR Coates, measurement planned.						
10 (682015)	^{63}Cu	N2N REACTION	TR	1.2+7	5.0	1	KYU	Y. Kanda. For neutron yield monitor. A few data available.
11 (682016)	^{63}Cu	N2N REACTION	1.4+7	2.0+7	5.0	1	KYU	Y. Kanda. For neutron yield monitor. Large discrepancies among data.
12 (682017)	^{65}Cu	N2N REACTION	TR	1.2+7	5.0	1	KYU	Y. Kanda. For neutron yield monitor.
		Status: JUL Qaim, NP/A 185 614(1972), data at 15.0 MeV. HAM Mogharrab+, AKE 19 107(1972), data at 14 MeV. JAE Kanda+, JAERI-1207(1972), evaluation 11 to 20 MeV.						
13 (682018)	^{65}Cu	N2N XSECTION	1.5+7	2.0+7	5.0	1	KYU	Y. KANDA For nuclear yield monitor. Large discrepancies among data.
		Status: JUL Qaim, NP/A 185 614(1972), data at 15.0 MeV. HAM Mogharrab+, AKE 19 107(1972), data at 14 MeV. JAE Kanda+, JAERI-1207(1972), evaluation 11 to 20 MeV.						
14 (702013)	^{64}Zn	N,GAMMA	2.4+4		10.0	3	FE	H. Nakamura. For normalization of the calculated cross section curve.
15 (702014)	Zr	DIFF INELAST energy dist	4.0+6	7.0+6	< 20.0	3	FE	H. Nakamura. For investigations of the level density parameters.
16	^{93}Zr	N,GAMMA	1.0+2	4.0+5	30.0	2	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. No experimental data above 100 eV.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
17	^{95}Mo	N,GAMMA	5.0+4	4.0+5	30.0	2	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data above 50 keV.
18	^{97}Mo	N,GAMMA	6.0+4	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data above 60 keV.
19	^{99}Tc	N,GAMMA	5.0+4	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data above 50 keV.
20	^{101}Ru	N,GAMMA	1.0+2	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data above 100 eV.
21	^{102}Ru	N,GAMMA	1.0+2	4.0+5	30.0	2	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data except 3 data points at 3, 24 and 190 keV.
22	^{104}Ru	N,GAMMA	1.0+2	4.0+5	30.0	2	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. There are 7 points in the range 1 keV to 15 MeV. But the discrepancies are remarkable at 24 keV and 14 ∿ 15 MeV.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
23	^{105}Pd	N,GAMMA	1.0+2	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data above 100 eV.
24	^{107}Pd	N,GAMMA	1.0+2	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data over the energy range above 100 eV.
25	^{109}Ag	N,GAMMA	1.0+2	4.0+5	30.0	2	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. There are 37 data points below 6 MeV, but the systematic discrepancy is observed between Weston's data and Kononov's data.
26 (702017)	In	DIFF INELAST energy dist	4.0+6	7.0+6	< 20.0	3	FE	N. Nakamura. For investigations of the level density parameters.
27	^{131}Xe	N,GAMMA	1.0+2	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data over the energy range above 100 eV.
28	^{133}Cs	N,GAMMA	1.0+2	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. The experimental data are abundant in the energy range below 15 MeV, but the systematic discrepancies are observed in the range above 10 keV.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
29	^{135}Cs	N,GAMMA	1.0+2	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data over the energy range above 100 eV.
30	^{143}Nd	N,GAMMA	1.0+2	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data in the energy range above 100 eV.
31	^{145}Nd	N,GAMMA	1.0+2	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data in the energy range above 100 eV.
32	^{147}Pm	N,GAMMA	1.0+2	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data in the energy range above 100 eV.
33	^{149}Sm	N,GAMMA	1.0+2	4.0+5	20.0	1	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data except a measurement at 30 keV.
34	^{151}Sm	N,GAMMA	1.0+2	4.0+5	30.0	2	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data in the energy range above 100 eV.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
35	^{153}Eu	N,GAMMA	4.0+4	4.0+5	30.0	2	NAIG SAEI	S. Iijima. H. Matsunobu. For fast reactor calculations. Desired with lower priority for wider energy range. No experimental data in the energy range above 40 keV.
36 (682052)	^{235}U	DIFF INELAST energy dist angula dist	1.3+4	1.0+7	10.0	1	SAEI	H. Matsunobu. For fast reactor. For nuclear data evaluation. No experimental data above 7.5 MeV. Available data insufficient. Xsections for excitation of individual levels desired. Energy resolution 1 ∿ 2% desired.

Status:
GEL Knitter+, ZP 257 108(1972), data 1.5 to 2.3 MeV.
LRL Kammerdiener, UCRL-51232 (1972), data at 14 MeV.
ALD Batchelor+, AWRE/O-55/69, data 2 to 4 MeV.
ANL Guenther+, USNDC-3 13(1972), in progress to 4.0 MeV.

37 (682055)	^{235}U	N,GAMMA (alpha)	1.0+3	1.0+7	5.0∿10.0	1	JAE SAEI	S. Katsuragi. H. Matsunobu. For fast reactor. For nuclear data evaluation. Resolution 1∿2% desired. Large discrepancies exist among measurements. No experimental data above 2.6 MeV.

Status:
ORL Perez+, USNDC-1 145(1972), data 8.0 eV to 10 keV.
ORL De Saussure+, PR/C 7 2018(1973), analysis to 60 eV.

38	^{235}U	FISSION	1.0+3	1.0+5	2.0	1	SAEI	H. Matsunobu. Evaluation of the nuclear data on U-235, and design calculation for thermal and fast reactors. Absolute measurement wanted. Energy resolution 1 ∿ 2% desired. Discrepancies between the experimental data are very remarkable in the energy range below 70 keV.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
39	^{235}U	FISSION	1.0+5	1.0+6	1.0	1	SAEI	H. Matsurobu. Evaluation of the nuclear data on U-235, and design calculation for thermal and fast reactors. Absolute measurement wanted. Energy resolution 1 ∿ 2% desired.
40	^{235}U	FISSION	1.0+6	2.0+7	1.0∿2.0	1	SAEI	H. Matsunobu. Evaluation of the nuclear data on U-235, and design calculation for thermal and fast reactors. Absolute measurement wanted. Energy resolution 1 ∿ 2% desired. The experimental data are comparatively poor in the energy range above 6 MeV except 14 MeV data.
41	^{235}U	ELASTIC	1.0+3	1.0+7	2.0	1	SAEI	H. Matsunobu. Evaluation of the nuclear data on U-235, and design calculation for thermal and fast reactors. Energy resolution 1 ∿ 2% desired. The experimental data are very poor. No experimental data in the energy range above 5.5 MeV.
42	^{235}U	DIFF ELASTIC	1.0+3	1.0+7	2.0∿5.0	1	SAEI	H. Matsunobu. Evaluation of the nuclear data on U-235, and design calculation for thermal and fast reactors. Energy resolution 1 ∿ 2% desired. The experimental data are very poor. No experimental data in the energy range above 5.5 MeV.
43	^{235}U	N2N XSECTION	5.0+6	1.0+7	10.0	1	SAEI	H. Matsunobu. Evaluation of the nuclear data on U-235, and design calculation for thermal and fast reactors. Energy resolution 1 ∿ 2% desired. The experimental data are very poor.
44 (702032)	^{238}U	N,GAMMA	1.0+3	1.0+6	< 5.0	1	NAIG	S. Iijima. For fast reactor calculations. Precise measurement at some energy points also desired.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
		Status: KFK Bluhm, KFK-1798 (1973), data 10 keV to 5 MeV. FEI Panitkin, AE 33 782(1972), data 1.2 to 4 MeV. FEI Chelnokov+, YFI-13 6(1972), data 200 eV to 35 keV. CCP Stavissky+, AE 31 107(1971), data to 40 keV. ANL Poenitz, USNDC-1 8(1972), in progress 400 keV to 1.5 MeV. GEL Rohr+, EANDC(E)-150 (1972), in progress. LRL Czirr+, USNDC-1 94(1972), in progress to 1 MeV. NPL Ryves+, in progress 150 to 630 keV. ORL De Saussure+, USNDC-7 175(1973), in progress. HAR Sowerby +, AERE-R-7273 (1973), evaluation						
45 (712075)	^{239}Np	N,GAMMA	1.0+4	3.0+6	20.0	3	KYU	M. Ohta. For correction of calculated inelastic scattering cross section.
46 (682066)	^{239}Pu	DIFF INELAST	1.0+4	1.0+7	10.0	1	NAIG	M. Kawai. For fast reactor. Xsections for excitation of individual levels desired.
		Status: GEL Coppola+, ZP 232 286(1970), data 1.9 to 5.5 MeV. ANL Guenther+, USNDC-3 13(1972), in progress to 4.0 MeV.						
47 (702039)	^{239}Pu	N,GAMMA (alpha)	1.0+3	2.0+5	10.0	1	JAE	S. Katsuragi. For fast reactor. Large discrepancies exist among measurements.
		Status: FEI Chelnokov+, YFI-13 6(1972), data 200 eV to 12 keV. ORL Gwin+, NSE 45 25(1971), data thermal to 30 keV. ORL Weston+, USNDC-3 149(1972), work in progress.						
48 (702037)	^{239}Pu	NU	0.0+0	1.5+7	< 0.5	1	NAIG	M. Kawai. For fast reactor calculations.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	ENERGY(EV) MAX	ACCURACY (%)	P	LAB	REQUEXTOR, COMMENTS
		Status: IEA Manero+, REA 10 637(1972), review. CCP Volodin+, AE 33 901(1972), data to 1.6 MeV. BRC Frehaut+, EANDC(E)-150(1972), in progress 7 eV to 40 keV. LRL Howe+, USNDC-7 105(1973), in progress thermal to 15 MeV. RPI Reed+, USNDC-7 202(1973), in progress thermal to 100 eV. ORL Weston, in progress to 200 eV, planned to 1.5 MeV.						
49 (712080)	^{239}Pu	SPECT FISS N	THR			2	JAE	T. Iijima. For fast reactors. Accuracy of nuclear temperature for Maxwell distribution is required within 30 keV.
		Status: KFK Werle+, JNE 26 165(1972), data 100 keV to 10 MeV. ANL Smith, ANL-7910 18(1972), data 300 keV to 8 MeV. HAR Rose+, preliminary data available.						
50 (682071)	^{240}Pu	N,GAMMA (res. param)	1.0+3	1.5+7	10.0	1	JAE	S. Katsuragi. For fast reactor.
		Status: RPI Hockenbury+, NSE 49 153(1972), previous discrepancies resolved. HAR Moxon+, AERE-PR/NP19 (1972), work in progress. ORL Weston+, measurement in progress.						
51 (682072)	^{241}Pu	FISSION (res. param)	1.0+3	1.5+7	10.0	1	JAE	S. Katsuragi. For fast reactor. Above 50 eV levels missing.
		Status: SAC Blons+, NSE 51 130(1973), data 1 eV to 30 keV. KFK Kaeppeler+, NSE 15 124(1973), data 10 keV to 1.2 MeV relative to U-235. LRL Behrens+, NCSAC-42 130(1971), in progress 1 keV to 15 MeV. GEL Theobald+, EANDC(E)-150 (1972), in progress. ORL Weston+, USNDC-7 179(1973), in progress thermal to 20 keV.						

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
52	^{243}Pu	FISSION	THR	5.0+5	10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
53	^{243}Pu	FISSION	2.0+6	1.0+7	10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
54	^{243}Pu	N,GAMMA	THR	1.0+7	10.0~20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
55	^{241}Am	N,GAMMA	1.0-2	1.0-1	5.0~10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel. Energy dependence wanted.
56	^{241}Am	N,GAMMA	2.0+1	1.0+7	10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. (n,γ) cross sections to the ground and isomer states of Am-242. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
57	^{242}Am	FISSION	1.0+6	6.0+6	10.0~20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. (n,γ) cross section of the ground state of Am-242. Neutron shielding design for transport cask of spent fuel.
58	^{242}Am	FISSION	6.0+6	1.0+7	10.0~20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. (n,f) cross sections of the ground and isomer states of Am-242. Neutron shielding design for transport cask of spent fuel.
59	^{242}Am	N,GAMMA	THR	1.0+7	5.0~20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. (n,γ) cross sections of the ground and isomer states of Am-242. Neutron shielding design for transport cask of spent fuel.
60	^{243}Am	FISSION	4.0+6	1.0+7	10.0~20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
61	^{243}Am	N,GAMMA	1.0+2	1.0+7	5.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. (n,γ) cross sections to the ground and isomer states of Am-244. Neutron shielding design for transport cask of spent of fuel.
62	^{244}Am	FISSION	THR	1.0+7	10.0∿20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
63	^{244}Am	N,GAMMA	THR	1.0+7	10.0∿20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
64	^{242}Cm	FISSION	THR	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
65	^{242}Cm	N,GAMMA	THR	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
66	^{243}Cm	FISSION	1.0-1	1.0+0	10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel. Energy dependence wanted.
67	^{243}Cm	FISSION	2.0+1	1.0+5	10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
68	^{243}Cm	FISSION	3.0+6	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel Neutron shielding design for transport cask of spent fuel.
69	^{243}Cm	N,GAMMA	1.0-2	1.0+1	5.0∿10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thremal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel. Energy dependence wanted.
70	^{243}Cm	N,GAMMA	2.0+1	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
71	^{244}Cm	FISSION	1.0+3	1.0+7	5.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
72	^{244}Cm	N,GAMMA	5.0+2	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
73	^{245}Cm	FISSION	1.0-2	1.0+0	5.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel. Energy dependence wanted.
74	^{245}Cm	FISSION	6.0+1	1.0+4	5.0∿10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
75	^{245}Cm	FISSION	3.0+6	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY (EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
76	^{245}Cm	N,GAMMA	1.0-2	1.0+0	10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel. Energy dependence wanted.
77	^{245}Cm	N,GAMMA	6.0+1	1.0+7	20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
78	^{246}Cm	FISSION	1.0-2	5.0+0	20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel. Energy dependence wanted.
79	^{246}Cm	FISSION	1.0+3	1.0+4	20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
80	^{246}Cm	FISSION	3.0+6	1.0+7	20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDES	QUANTITY	ENERGY (EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
81	^{246}Cm	N,GAMMA	1.0-2	5.0+0	10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel. Energy dependence wanted.
82	^{246}Cm	N,GAMMA	4.0+2	1.0+7	20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
83	^{247}Cm	FISSION	THR	2.0+1	5.0~10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel. Energy dependence wanted.
84	^{247}Cm	FISSION	6.0+1	1.0+4	5.0~10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY (EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
85	^{247}Cm	N,GAMMA	3.0+6	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
86	^{247}Cm	N,GAMMA	THR	1.0+7	20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
87	^{248}Cm	FISSION	THR	2.0+1	20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel. Energy dependence wanted.
88	^{248}Cm	FISSION	1.0+3	1.0+4	20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
89	^{248}Cm	FISSION	3.0+6	1.0+7	20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
90	^{248}Cm	N,GAMMA	THR	1.0+7	10.0~20.0	1	PNC SAEI	R. Yumoto H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
91	^{249}Cm	FISSION	THR	1.0+7	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
92	^{249}Cm	N,GAMMA	THR	1.0+7	10.0~20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
93	^{250}Cm	FISSION	THR	1.0+7	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
94	^{250}Cm	N,GAMMA	THR	1.0+7	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
95	^{249}Bk	FISSION	THR	2.0+5	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
96	^{249}Bk	FISSION	5.0+6	1.0+7	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
97	^{249}Bk	N,GAMMA	THR	1.0+7	20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
98	^{250}Bk	FISSION	THR	1.0+7	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
99	^{250}Bk	N,GAMMA	THR	1.0+7	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
100	^{249}Cf	N,GAMMA	THR	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
101	^{250}Cf	FISSION	THR	1.0+7	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
102	^{250}Cf	N,GAMMA	THR	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
103	^{251}Cf	FISSION	THR	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
104	^{251}Cf	N,GAMMA	THR	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding desgin for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY (EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
105	^{252}Cf	FISSION	THR	2.0+1	10.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel. Energy dependence wanted.
106	^{252}Cf	FISSION	5.0+6	1.0+7	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
107	^{252}Cf	N,GAMMA	THR	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
108	^{253}Cf	FISSION	THR	1.0+7	10.0∿20.0	1	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
109	^{253}Cf	N,GAMMA	THR	1.0+7	10.0∿20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

REF	NUCLIDE	QUANTITY	ENERGY(EV) MIN	MAX	ACCURACY (%)	P	LAB	REQUESTOR, COMMENTS
110	^{254}Cf	FISSION	THR	1.0+7	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.
111	^{254}Cf	N,GAMMA	THR	1.0+7	20.0	2	PNC SAEI	R. Yumoto. H. Matsunobu. Burn up calculation of thermal and fast reactors, and estimation for build up of transuranium nuclides in spent fuel. Neutron shielding design for transport cask of spent fuel.

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(2) Igarasi, S.: JAERI-memo 4167 (1970)

(3) Igarasi, S.: JAERI-M 4572 (1971)

(4) INDC(SEC)-38/U (1974)

(5) To be published from IAEA/NDS.

(6) Fission Product Nuclear Data Working Group (JNDC): JAERI-M 5752 (1974)